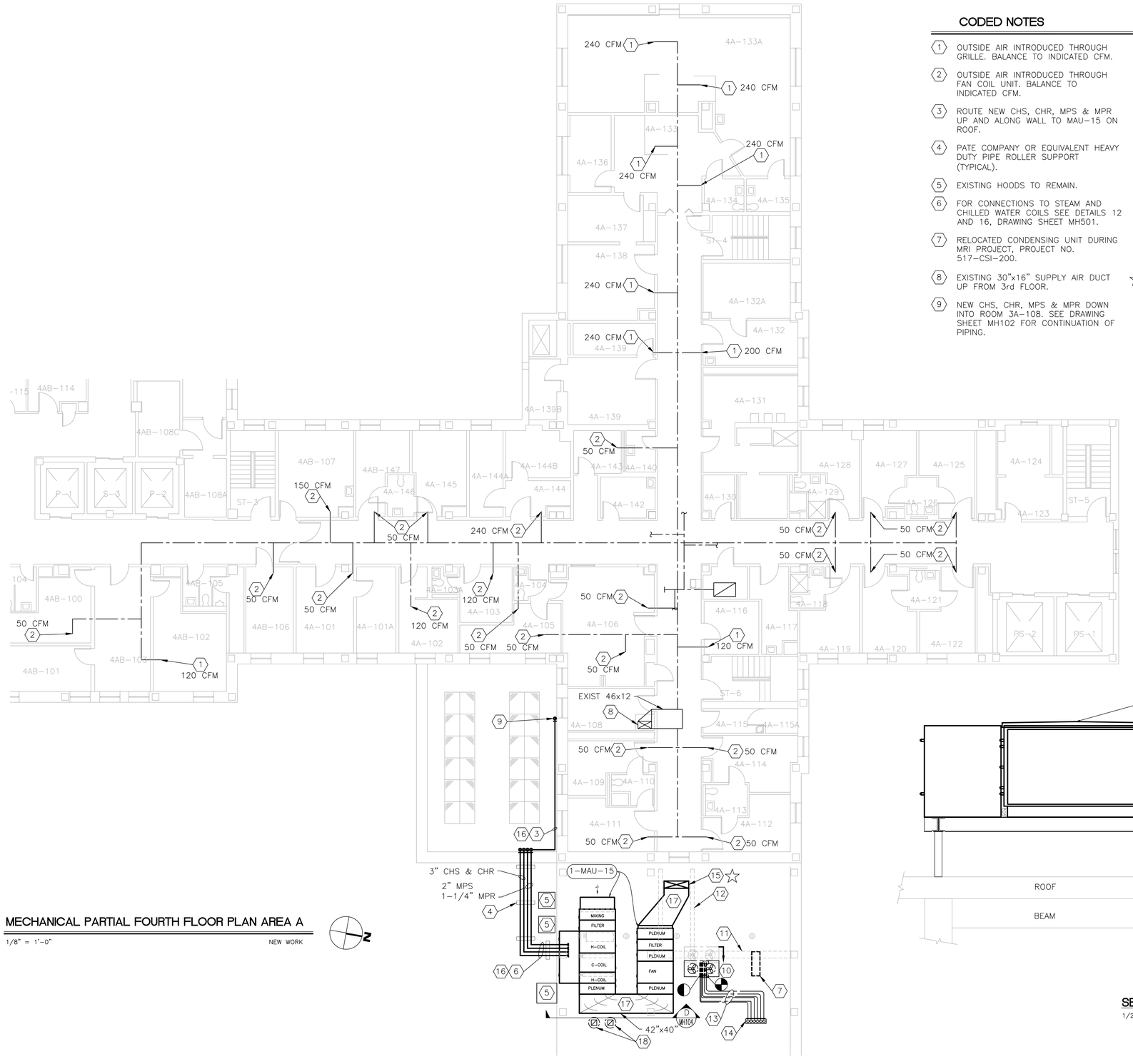



## CODED NOTES

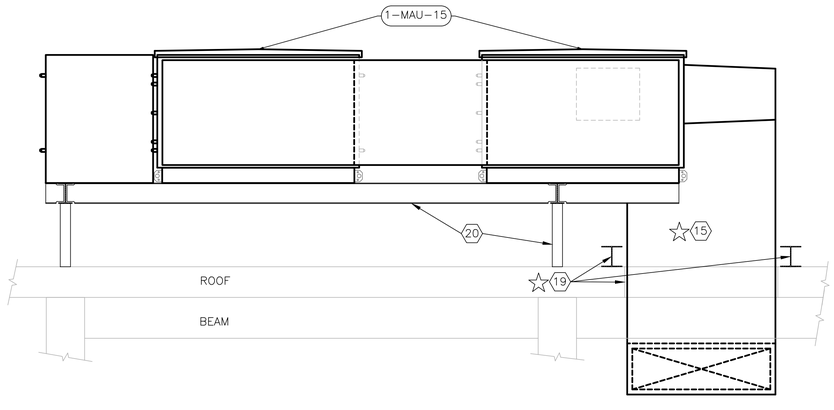
1. OUTSIDE AIR INTRODUCED THROUGH GRILLE. BALANCE TO INDICATED CFM.
2. OUTSIDE AIR INTRODUCED THROUGH FAN COIL UNIT. BALANCE TO INDICATED CFM.
3. ROUTE NEW CHS, CHR, MPS & MPR UP AND ALONG WALL TO MAU-15 ON ROOF.
4. PATE COMPANY OR EQUIVALENT HEAVY DUTY PIPE ROLLER SUPPORT (TYPICAL).
5. EXISTING HOODS TO REMAIN.
6. FOR CONNECTIONS TO STEAM AND CHILLED WATER COILS SEE DETAILS 12 AND 16, DRAWING SHEET MH501.
7. RELOCATED CONDENSING UNIT DURING MRI PROJECT, PROJECT NO. 517-CSI-200.
8. EXISTING 30"x16" SUPPLY AIR DUCT UP FROM 3rd FLOOR.
9. NEW CHS, CHR, MPS & MPR DOWN INTO ROOM 3A-108. SEE DRAWING SHEET MH102 FOR CONTINUATION OF PIPING.
10. MOVE EXISTING CONDENSING UNIT TO CLEAR CONCRETE BEAM BELOW TO ALLOW INSTALLATION OF NEW I-BEAM (SEE STRUCTURAL DRAWINGS) TO ACCOMMODATE THE PENETRATION FOR THE NEW SUPPLY AIR DUCT FROM MAU-15. PROVIDE NEW PATE OR EQUIVALENT EQUIPMENT CURBS THAT MATCH THE EXISTING CURBS. EVACUATE AND RECHARGE CONDENSING UNIT AFTER REINSTALLING UNIT. INSULATE REFRIGERANT LINES AS NEEDED. ELECTRICAL CONTRACTOR TO SHORTEN AND REINSTALL WIRING TO THE DISCONNECT.
11. EXISTING CONCRETE BEAM BELOW.
12. NEW WIDE FLANGE BEAM.
13. EXISTING REFRIGERANT AND ELECTRICAL LINES.
14. EXISTING ROOF PENETRATION CURB.
15. 54"x16" SUPPLY AIR DUCT DOWN THROUGH ROOF. PROVIDE CURB AS NEEDED FOR THIS PENETRATION. COORDINATE THIS PENETRATION WITH NEW STRUCTURE. SEE DRAWING SHEET MH102 FOR CONTINUATION. NEW BEAMS MUST BE INSTALLED PRIOR TO CUTTING OPENING.
16. FURNISH AND INSTALL COMPLETE THERMON 5-FLX-1-OJ HEAT TRACE CABLE AND POWER CONNECTOR, 20A, 120V/1/60 ON MPS, MPR, CHS AND CHR PIPING TO 1-MAU-15 STEAM COIL AND CHILLED WATER COILS. 2" THICK INSULATION SHALL BE ONE SIZE LARGER FOR CABLE ATTACHED TO PIPE. PROVIDE THERMOSTAT B4X-15140 AND SET AT 40°F. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
17. INSULATE SUPPLY AIR DUCT WORK EXPOSED TO OUTDOOR WEATHER WITH 2" THICK FACED MINERAL FIBER BOARD. PROTECT INSULATION WITH 0.032" ALUMINUM JACKET USING LOCK JOINTS FOR CONTINUOUS WEATHER TIGHT SYSTEM.
18. EXISTING FANS TO REMAIN.
19. NEW BEAMS MUST BE INSTALLED PRIOR TO CUTTING OPENING.
20. NEW STRUCTURAL SUPPORT. SEE STRUCTURAL DRAWINGS.

BASE BID: ALL EXISTING DUCTWORK BEING SERVED BY MAU-15 ON THIS FLOOR SHALL BE PRESSURE TESTED, THOROUGHLY CLEANED, AND SANITIZED TO AVOID THE POSSIBILITY OF CONTAMINATION.

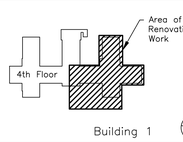
DEDUCT ALTERNATE 1: DEDUCT ALL TESTING AND CLEANING OF EXISTING DUCTWORK ASSOCIATED WITH UNITS MAU-14, 15, 30 & 31.

## MECHANICAL PARTIAL FOURTH FLOOR PLAN AREA A

1/8" = 1'-0" NEW WORK




SECTION D MH104
1/2"=1'-0"

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| APPROVED: INFECTION CONTROL<br>SHAWN M. MILLS | APPROVED: ASSOCIATE DIRECTOR for PATIENT CARE SERVICES/EXECUTIVE NURSE<br>DEBRA LEGG, RN, MSN |
| APPROVED: | APPROVED: SERVICE LINE CHIEF |

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| APPROVED: ASSOCIATE DIRECTOR<br>J. BRIAN NIMMO, MS | |
| APPROVED: CHIEF OF STAFF<br>JOHN D. BERRYMAN, M. D. | |

| | | |
|---|---|---|
| DRAWING TITLE: MECH PARTIAL 4th FLR AREA A MECHANICAL NEW WORK | | DRAWING No. MH104 |
| PROJECT TITLE: HVAC NEGATIVE AIR CORRECTIONS | | PROJECT No. 517-11-105 |
| | | DRAWN BY: PDC |
| DATE 07/06/2012 | REV. | SCALE |
| | | CHECKED BY: JPA |

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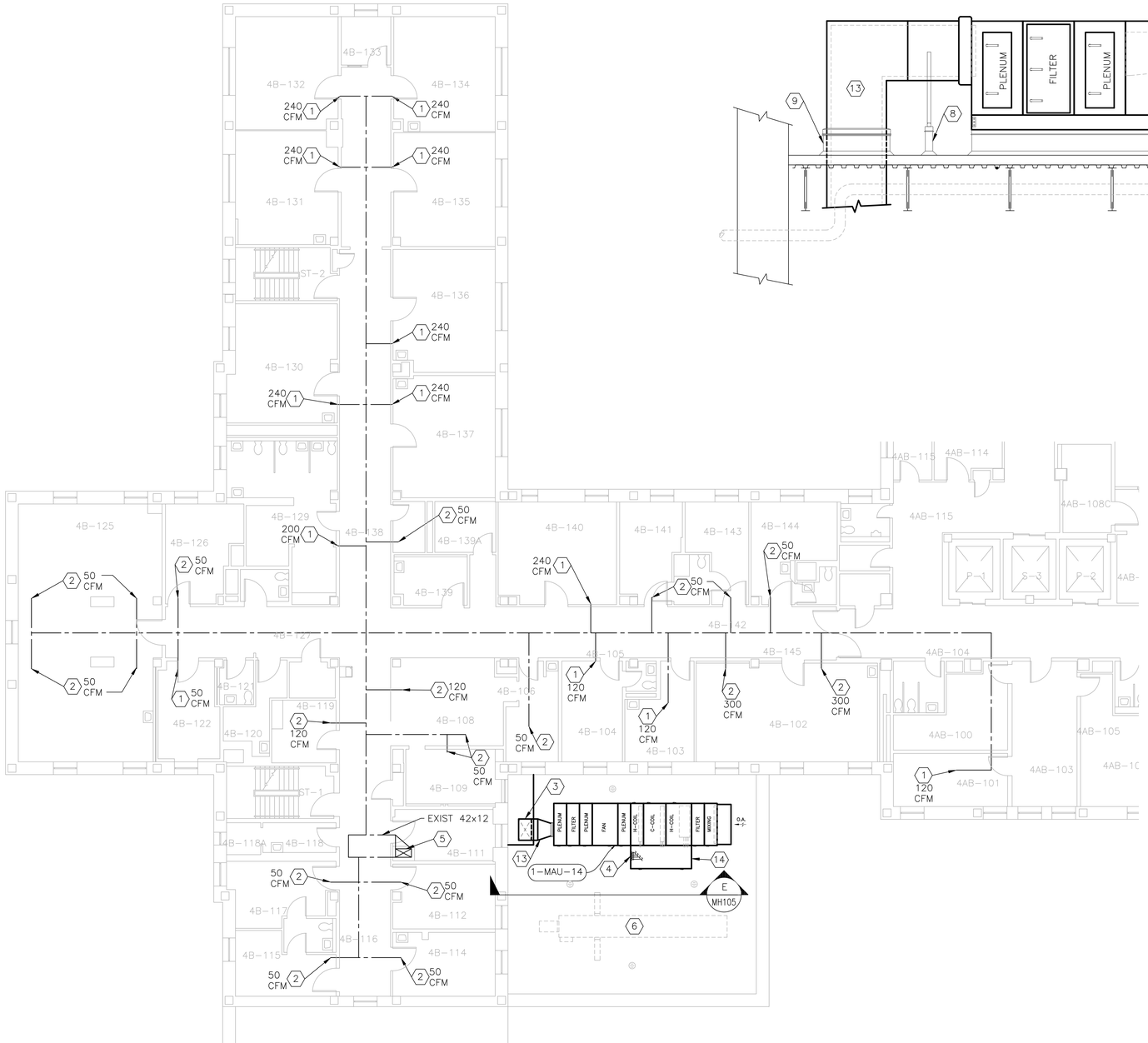
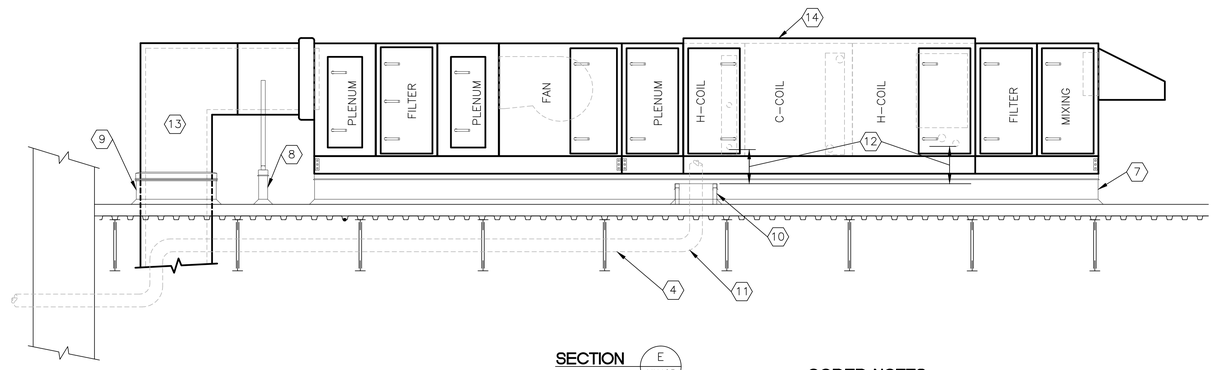



SECTION E
1/2"=1'-0" MH105

## CODED NOTES

1. OUTSIDE AIR INTRODUCED THROUGH GRILLE. BALANCE TO INDICATED CFM.
2. OUTSIDE AIR INTRODUCED THROUGH FAN COIL UNIT. BALANCE TO INDICATED CFM.
3. 40"x24" SUPPLY AIR. SIZE EXISTING ROOF OPENING WITH NEW CURB TO PASS NEW SUPPLY AIR DUCT DOWN TO JUST BELOW EXITING STRUCTURE AND PASS INTO ROOM 3B-110 THROUGH EXISTING WALL OPENING SEE DRAWING MH103 FOR CONTINUATION.
4. NEW 3" CHS, 3" CHR, 2" MPS & 1-1/4"MPR FROM BELOW THROUGH ROOF CURB AND CONNECTION TO MAU-14 COILS. SEE DETAILS 12 AND 16 ON DRAWING SHEET MH501 FOR CONNECTION TO COILS.
5. 30"x16" EXISTING SUPPLY AIR DUCT UP FROM 3rd FLOOR.
6. EQUIPMENT TO BE INSTALLED AT THIS LOCATION DURING ANCILLARY CARE CLINICS PROJECT, PROJECT NO. 517-316.
7. PROVIDE PATE ES-5 (14 GAUGE) OR EQUIVALENT STYLE EQUIPMENT SUPPORT CURB, MINIMUM HEIGHT TO PROVIDE FOR CONDITIONS AS CALLED OUT IN CODED NOTE 12.
8. PROVIDE PATE DSS-5 OR EQUIVALENT STYLE DUCT SUPPORT WITH CURB.
9. PROVIDE PATE PC-5 OR EQUIVALENT STYLE DUCT PENETRATION WITH CURB.
10. PROVIDE PATE PCA-5 WITH PCC-3 CAP & BOOT OR EQUIVALENT STYLE PIPE CURB WITH CAP AND BOOT FOR PIPES SUPPLYING STEAM AND COOLING COILS.
11. FROM BELOW ROOF STRUCTURE AND UP TO MAU-14 FURNISH AND INSTALL COMPLETE THERMON 5-FLX-1-OJ HEAT TRACE CABLE AND POWER CONNECTOR, 20A, 120V/1/60 ON MPS, MPR, CHS AND CHR PIPING TO 1-MAU-14 STEAM COIL AND CHILLED WATER COILS. 2" THICK INSULATION SHALL BE ONE SIZE LARGER FOR CABLE ATTACHED TO PIPE. PROVIDE THERMOSTAT B4X-15140 AND SET AT 40°F. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
12. PROVIDE THE NECESSARY MOUNTING HEIGHT OF THE AIR HANDLING UNIT SO THAT THE STEAM CONDENSATE RETURN HAS THE PROPER DISTANCE FOR SLOPE AND TURN DOWN INTO THE ROOF PENETRATION CURB TO ALLOW FOR MINIMUM DISTANCE AS SHOWN IN DETAIL 16 DRAWING SHEET MH501 (STEAM COIL-PIPING CONNECTIONS).
13. INSULATE SUPPLY AIR DUCT WORK EXPOSED TO OUTDOOR WEATHER WITH 2" THICK FACED MINERAL FIBER BOARD. PROTECT INSULATION WITH 0.032" ALUMINUM JACKET USING LOCK JOINTS FOR CONTINUOUS WEATHER TIGHT SYSTEM.
14. SERVICE VESTIBULE SUPPLIED BY MANUFACTURE OF MAU-14.

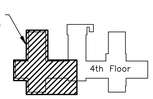
BASE BID: ALL EXISTING DUCTWORK BEING SERVED BY MAU-14 ON THIS FLOOR SHALL BE PRESSURE TESTED, THOROUGHLY CLEANED, AND SANITIZED TO AVOID THE POSSIBILITY OF CONTAMINATION.

DEDUCT ALTERNATE 1: DEDUCT ALL TESTING AND CLEANING OF EXISTING DUCTWORK ASSOCIATED WITH UNITS MAU-14, 15, 30 & 31.

## MECHANICAL PARTIAL FOURTH FLOOR PLAN AREA B

1/8" = 1'-0" NEW WORK

Area of Renovation Work




Building 1

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| APPROVED: | APPROVED: SERVICE LINE CHIEF |

APPROVED: MEDICAL CENTER DIRECTOR
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APPROVED: ASSOCIATE DIRECTOR
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APPROVED: CHIEF OF STAFF
JOHN D. BERRYMAN, M. D.

DRAWING TITLE: MECH PARTIAL 4th FLR AREA B MECHANICAL NEW WORK

PROJECT TITLE: HVAC NEGATIVE AIR CORRECTIONS

DATE 07/06/2012 | REV. | SCALE

DRAWING No. MH105

PROJECT No. 517-11-105

DRAWN BY: PDC

CHECKED BY: JPA

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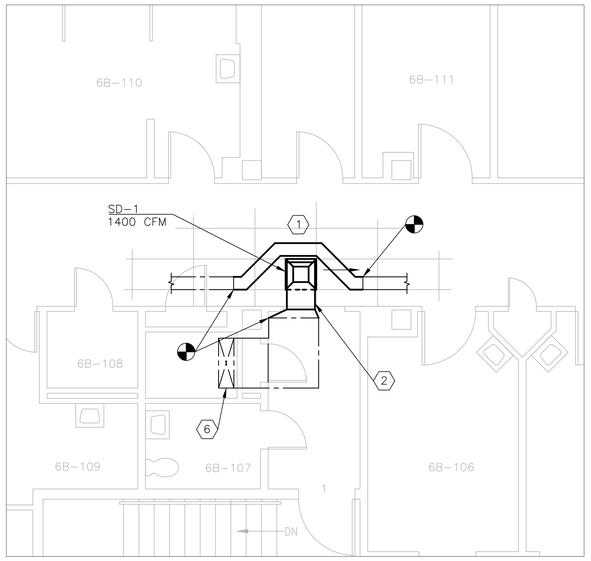
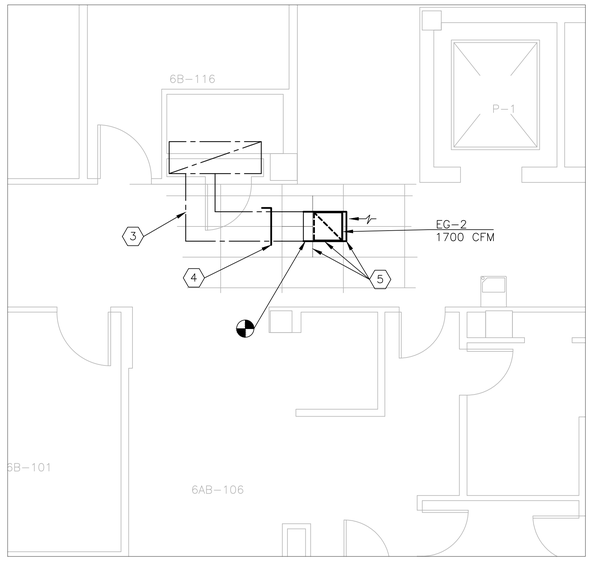
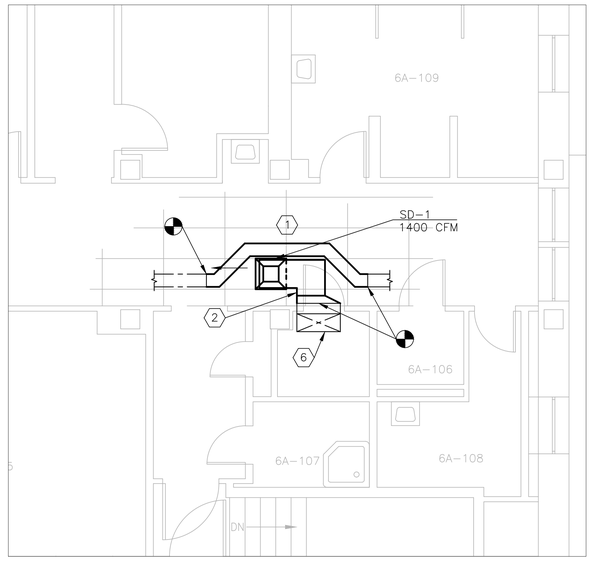



SOUTH CORRIDOR




CENTRAL CORRIDOR



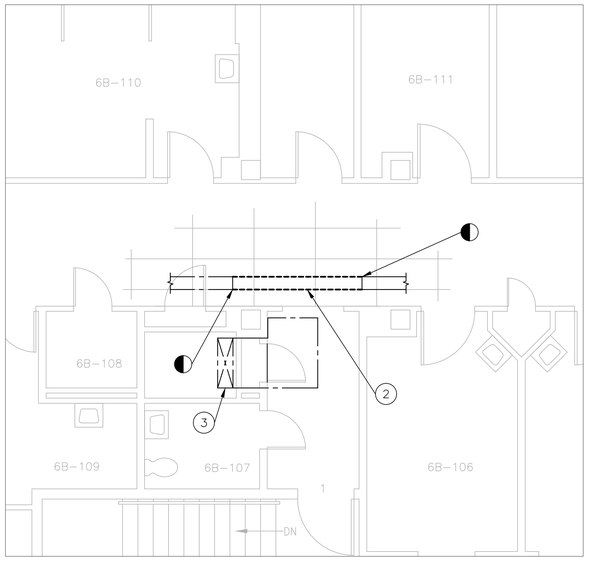

NORTH CORRIDOR

## MECHANICAL SIXTH FLOOR PLAN

1/8" = 1'-0" NEW WORK

## CODED NOTES NEW WORK

1. ADD NEW DUCTWORK AROUND AREA FOR NEW SUPPLY AIR DUCT AND DIFFUSER. (THE EXISTING DUCT SIZE SEEMS TO BE 10"x8").
2. INSTALL NEW 22"x10" SUPPLY AIR DUCT FROM EXISTING CAPPED OFF DUCT TO NEW DIFFUSER. REMOVE CAP BEFORE CONNECTING.
3. EXISTING 23"x12" EXHAUST AIR DUCT.
4. PROVIDE NEW BALANCING DAMPER IN EXISTING 23"x12" EXHAUST AIR DUCT.
5. EXTEND NEW 23"x12" SUPPLY AIR DUCT TO NEW EXHAUST GRILLE. INSTALL NEW CEILING GRID TO KEEP GRILLE AT CENTER LINE OF DUCT. THIS WILL ALLOW INSTALLATION WITHOUT MOVING PIPING AND OTHER ITEMS ABOVE CEILING IN THIS AREA.
6. EXISTING SUPPLY DUCT FROM PENTHOUSE MECHANICAL ROOM ABOVE.

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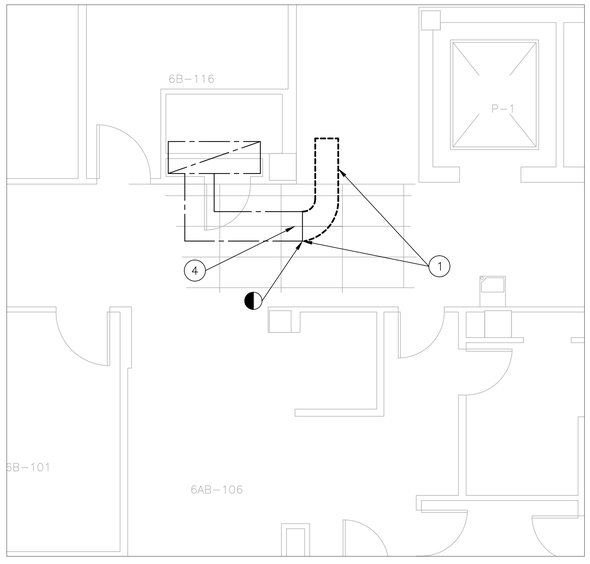


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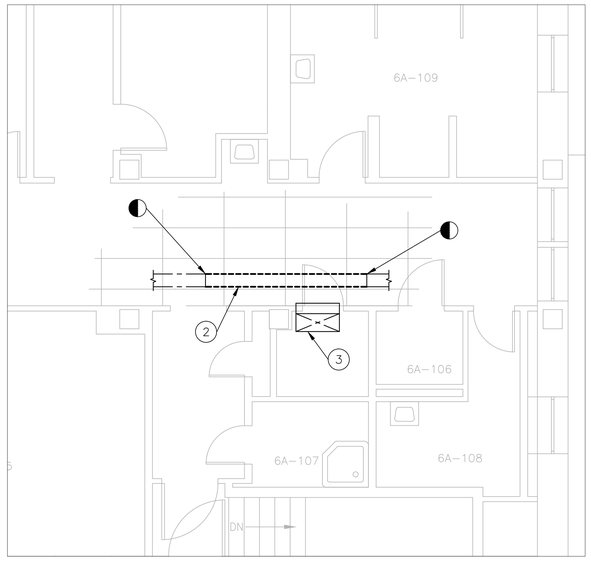


NORTH CORRIDOR

## MECHANICAL SIXTH FLOOR PLAN

1/8" = 1'-0" DEMOLITION

## CODED NOTES DEMOLITION

1. REMOVE 18"x12" EXHAUST AIR DUCT AND THE ASSOCIATED REDUCING ELBOW (23"x12" TO 18"x12").
2. REMOVE SECTION OF EXISTING DUCT (SEEMS TO BE A 10"x8") TO ALLOW NEW DUCT TO OFFSET ALLOWING INSTALLATION OF NEW DIFFUSER AND SUPPLY DUCT FROM EXISTING CAPPED SUPPLY DUCT. SEE NEW WORK PLAN THIS SHEET (MH106).
3. EXISTING SUPPLY DUCT FROM PENTHOUSE MECHANICAL ROOM ABOVE TO REMAIN.
4. REMOVE THIS SECTION OF T-BAR GRID.

Area of Renovation Work

6th Floor

Building 1

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| APPROVED: INFECTION CONTROL<br>SHAWN M. MILLS | APPROVED: ASSOCIATE DIRECTOR for PATIENT CARE SERVICES/EXECUTIVE NURSE<br>DEBRA LEGG, RN, MSN | APPROVED: ASSOCIATE DIRECTOR<br>J. BRIAN NIMMO, MS |
| APPROVED: | APPROVED: SERVICE LINE CHIEF | APPROVED: CHIEF OF STAFF<br>JOHN D. BERRYMAN, M. D. |

DRAWING TITLE: MECHANICAL SIXTH FLOOR PLAN MECHANICAL NEW WORK

PROJECT TITLE: HVAC NEGATIVE AIR CORRECTIONS

DATE 07/06/2012 | REV. | SCALE

DRAWING No. MH106

PROJECT No. 517-11-105

DRAWN BY: PDC

CHECKED BY: JPA

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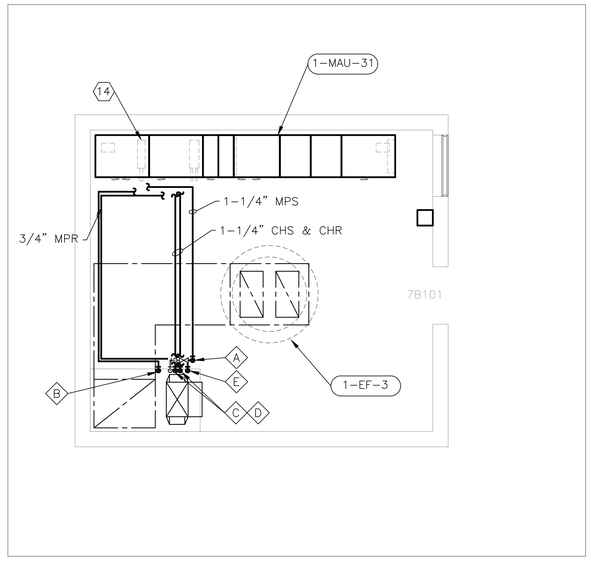
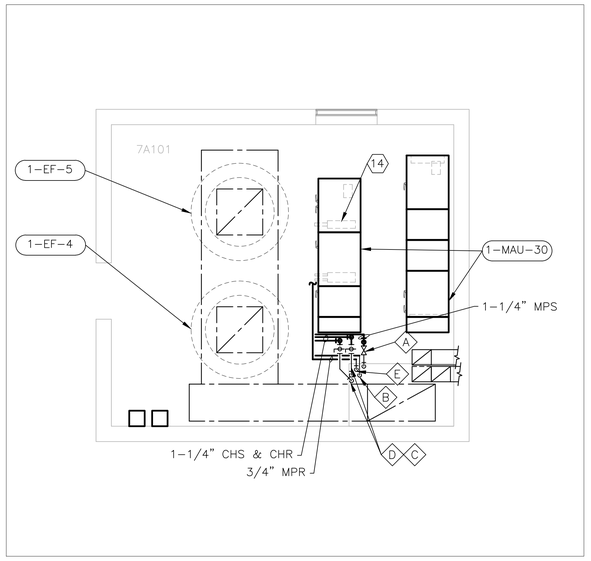



SOUTH PENTHOUSE




NORTH PENTHOUSE

## MECHANICAL PENTHOUSE FLOOR PLAN

1/4" = 1'-0" PIPING NEW WORK

N

## CODED NOTES EXISTING PIPING

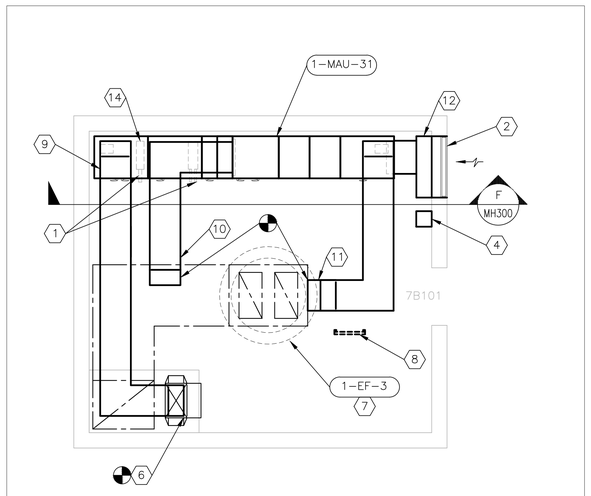
- (A) MEDIUM PRESSURE STEAM SUPPLY. (PIPING SIZES TO BE FIELD VERIFIED BUT SEEM TO BE 1-1/2" MEDIUM PRESSURE STEAM SUPPLY).
- (B) STEAM RETURN
- (C) CHILLED WATER SUPPLY. (PIPING SIZES TO BE FIELD VERIFIED BUT SEEM TO BE 1-1/4" CHILLED WATER SUPPLY).
- (D) CHILLED WATER RETURN. (PIPING SIZES TO BE FIELD VERIFIED BUT SEEM TO BE 1-1/4" CHILLED WATER RETURN).
- (E) CONDENSATE DRAIN

BASE BID: ALL EXISTING DUCTWORK BEING SERVED BY MAU-30 & MAU-31 ON THIS FLOOR SHALL BE PRESSURE TESTED, THOROUGHLY CLEANED, AND SANITIZED TO AVOID THE POSSIBILITY OF CONTAMINATION.

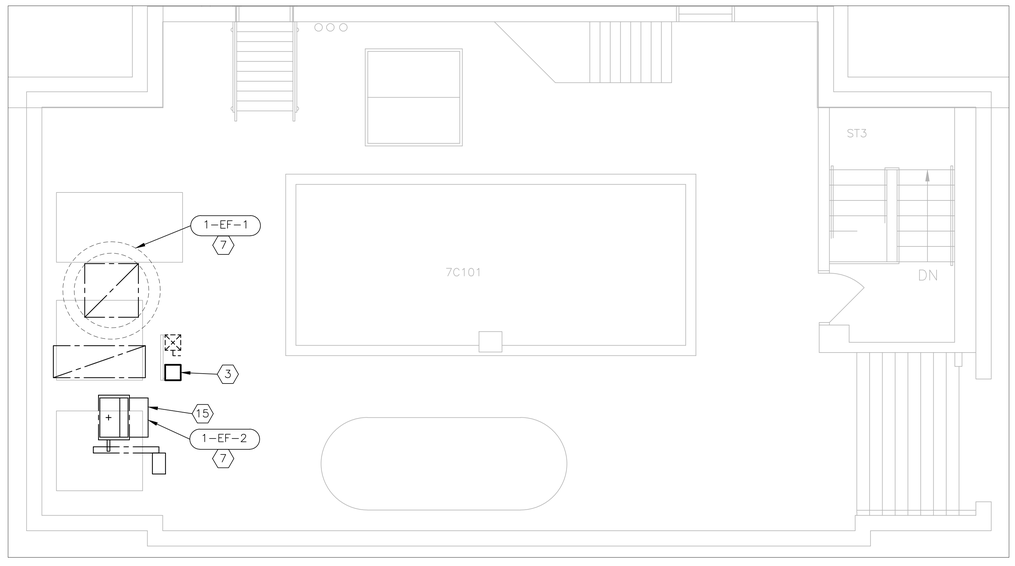
DEDUCT ALTERNATE 1: DEDUCT ALL TESTING AND CLEANING OF EXISTING DUCTWORK ASSOCIATED WITH UNITS MAU-14, 15, 30 & 31.

## CODED NOTES NEW WORK

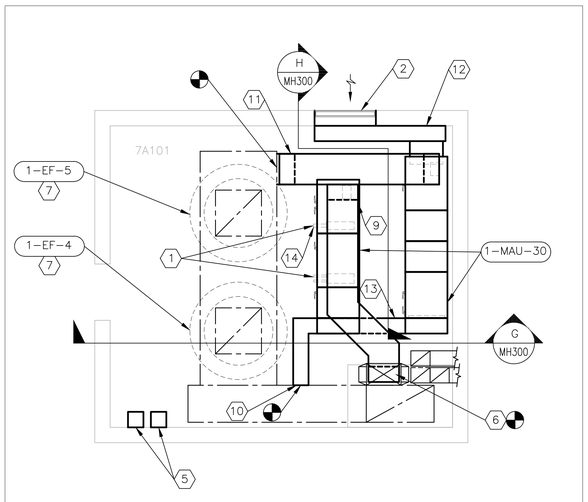
1. COMPLETE STEAM AND CHILLED WATER COIL PIPING TO CONNECT INTO EXISTING PIPING WITH-IN PENTHOUSE.
2. NEW 32"x48" INTAKE LOUVER.
3. NEW VFD FOR EXHAUST AIR FAN (1-EF-2). WIRING PROVIDED BY ELECTRICAL CONTRACTOR.
4. NEW VFD FOR EXHAUST AIR FAN (1-EF-3). WIRING PROVIDED BY ELECTRICAL CONTRACTOR.
5. NEW VFD FOR EXHAUST AIR FANS (1-EF-4) & (1-EF-5). WIRING PROVIDED BY ELECTRICAL CONTRACTOR.
6. CONNECT NEW 24"x12" SUPPLY AIR DUCT FROM MAU TO EXISTING CAPPED OFF DUCT (SEE SHEET MH107 FOR CONTINUATION). REMOVE CAP BEFORE MAKING FINAL CONNECTION.
7. PROVIDE DDC EQUIPMENT TO ALLOW REMOTE CONTROL OF EXHAUST FAN.
8. REMOVE METAL STRUT MOUNTING POST ASSEMBLY AFTER ELECTRICIAN HAS MOVED ALL APPARATUS.
9. 24"X12" SUPPLY AIR DUCT TO CONNECT INTO EXISTING SUPPLY AIR DUCT SUPPLYING THE 6th FLOOR.
10. CONNECT NEW 24"x12" EXHAUST DUCT TO EXISTING EXHAUST MAIN AS FAR AS POSSIBLE FROM EXISTING FAN(S).
11. CONNECT NEW 24"x12" EXHAUST DUCT TO THE END OF THE EXISTING EXHAUST DUCT HEADER.
12. 12" DEEP INTAKE AIR PLENUM SIZED AS REQUIRED TO MAKE CONNECTION BETWEEN THE OUTSIDE AIR LOUVER AND THE MAU.
13. FULL SIZE DUCT TO CONNECT BETWEEN THE PLENUMS OF THE SPLIT MAKE UP AIR UNIT.
14. MAU-30 AND MAU-31 MUST BE ORDERED WITH THE STEAM HEATING COIL MOUNTED 8" HIGHER IN THE COIL MODULE COMPARED TO THE HEIGHT OF THE FACTORY MOUNTING.
15. REBALANCE EXHAUST FAN NUMBER 2 TO INCREASE THE CURRENT EXHAUST AIR AMOUNT TO 26,400 CFM.




SOUTH PENTHOUSE




CENTRAL PENTHOUSE

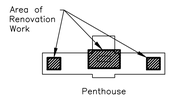



NORTH PENTHOUSE

## MECHANICAL PENTHOUSE FLOOR PLAN

1/4" = 1'-0" DUCT WORK NEW WORK

N




Building 1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| APPROVED: | APPROVED: SERVICE LINE CHIEF | APPROVED: CHIEF OF STAFF<br>JOHN D. BERRYMAN, M. D. |

DRAWING TITLE: MECHANICAL PENTHOUSE FLR PLAN MECHANICAL NEW WORK

PROJECT TITLE: HVAC NEGATIVE AIR CORRECTIONS

DATE 07/06/2012 | REV. | SCALE

DRAWING No. MH107

PROJECT No. 517-11-105

DRAWN BY: PDC

CHECKED BY: JPA

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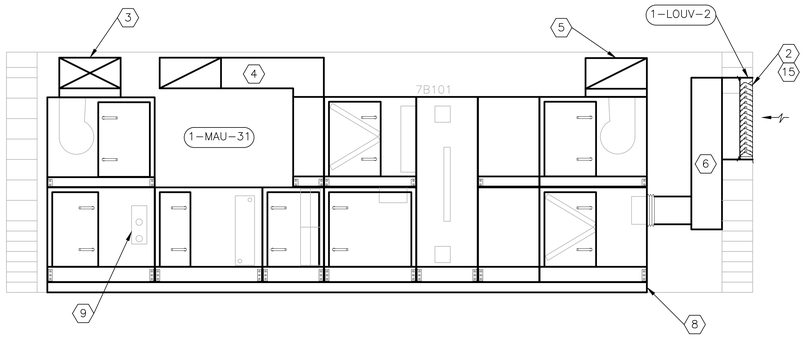
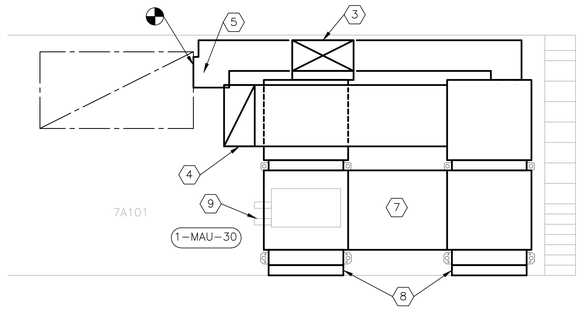



SECTION F
1/2"=1'–0"
MH107




SECTION G
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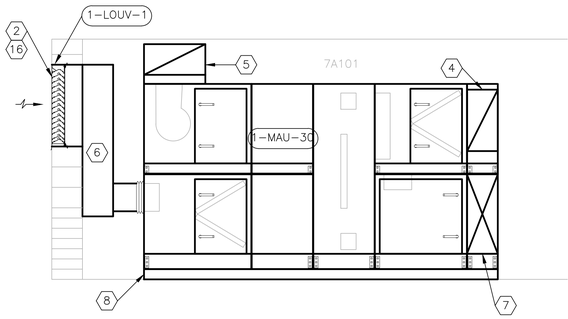
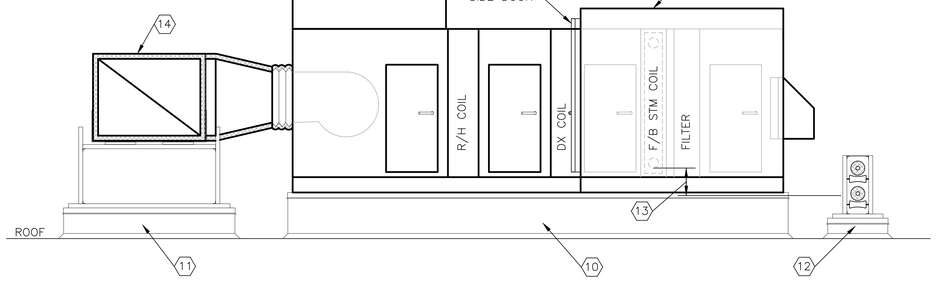
MH107




SECTION H
1/2"=1'–0"
MH107




SECTION C
1/2"=1'–0"
MH100

## CODED NOTES NEW WORK

1. NOT USED
2. 32"x48" INTAKE LOUVER.
3. 24"X12" SUPPLY AIR DUCT TO RUN AND CONNECT INTO EXISTING SUPPLY AIR DUCT SUPPLYING THE 6th FLOOR.
4. CONNECT NEW 24"x12" EXHAUST DUCT TO EXISTING EXHAUST MAIN AS FAR AS POSSIBLE FROM EXHAUST FAN(S).
5. CONNECT NEW 24"x12" EXHAUST DUCT TO THE END OF THE EXISTING EXHAUST DUCT HEADER.
6. 12" DEEP INTAKE AIR PLENUM SIZED AS REQUIRED TO MAKE CONNECTION BETWEEN THE OUTSIDE AIR LOUVER AND THE MAU. INSULATE PLENUM.
7. FULL SIZE DUCT TO CONNECT BETWEEN THE PLENUMS OF THE SPLIT MAKE UP AIR UNIT.
8. SUPPLY AN EXTRA 4" CURB. PATE ES–2 OR EQUIVALENT STYLE EQUIPMENT SUPPORT CURB.
9. MAU–30 AND MAU–31 MUST BE ORDERED WITH THE STEAM HEATING COIL MOUNTED 8" HIGHER IN THE COIL MODULE COMPARED TO THE HEIGHT OF THE FACTORY MOUNTING, FOR PROPER STEAM CONDENSATE RETURN.
10. PROVIDE PATE ES–5 914 GAUGE) OR EQUIVALENT STYLE EQUIPMENT SUPPORT CURB, MINIMUM HEIGHT TO PROVIDE FOR CONDITIONS AS CALLED OUT IN CODED NOTE 13.
11. PROVIDE PATE DSS–5 OR EQUIVALENT STYLE DUCT SUPPORT WITH CURB.
12. PROVIDE PATE PRS –5 OR EQUIVALENT STYLE HEAVY DUTY PIPE ROLLER SUPPORT FOR STEAM PIPING WITH CURB.
13. PROVIDE THE NECESSARY MOUNTING HEIGHT OF THE AIR HANDLING UNIT SO THAT THE STEAM CONDENSATE RETURN HAS THE PROPER DISTANCE FOR SLOPE AND TURN DOWN AND CONTINUATION FOR RETURN TO INSIDE OF BUILDING TO ALLOW FOR MINIMUM DISTANCE AS SHOWN IN DETAIL 16 DRAWING SHEET MH501 (STEAM COIL–PIPING CONNECTIONS).
14. INSULATE SUPPLY AIR DUCT WORK EXPOSED TO OUTDOOR WEATHER WITH 2" THICK FACED MINERAL FIBER BOARD. PROTECT INSULATION WITH 0.032" ALUMINUM JACKET USING LOCK JOINTS FOR CONTINUOUS WEATHER TIGHT SYSTEM.
15. LOUVER MOUNTED IN NEW OPENING.
16. LOUVER MOUNTED IN EXISTING INFILLED OPENING.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| APPROVED: INFECTION CONTROL<br>SHAWN M. MILLS | APPROVED: ASSOCIATE DIRECTOR for PATIENT CARE SERVICES/EXECUTIVE NURSE<br>DEBRA LEGG, RN, MSN | APPROVED: ASSOCIATE DIRECTOR<br>J. BRIAN NIMMO, MS | PROJECT TITLE: HVAC NEGATIVE AIR CORRECTIONS |
| APPROVED: | APPROVED: SERVICE LINE CHIEF | APPROVED: CHIEF OF STAFF<br>JOHN D. BERRYMAN, M. D. | DATE 07/06/2012 · REV. · SCALE |

DRAWING No. MH300
PROJECT No. 517–11–105
DRAWN BY: PDC
CHECKED BY: JPA

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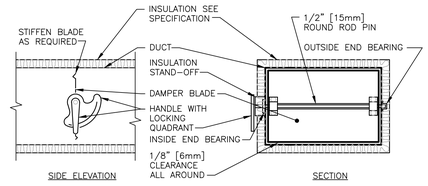
## DUCT PRESSURE CLASS TABLE

| FAN NO. | DUCT INVOLVED | POSITIVE (P) OR NEGATIVE (N) PRESSURE | MINIMUM PRESSURE CLASS W.G. IN. [mm] |
|---|---|---|---|
| 1-MAU-14<br>1-MAU-15 | FROM MAU TO CONNECTION TO EXISTING DUCTWORK | P | 2 [51] |
| 1-MAU-29 | FROM MAU TO PLENUM AND ROOM OUTLET | P | 2 [51] |
| 1-MAU-30<br>1-MAU-31 | FROM MAU TO CONNECTION TO EXISTING DUCT | P | 2 [51] |
| | FROM EXISTING DUCT TO ROOM OUTLET | P | 2 [51] |
| | FROM EXISTING DUCT TO RETURN FAN | N | 2 [51] |
| | FROM RETURN FAN TO EXISTING DUCT | P | 2 [51] |

## DUCT LEAKAGE CLASSIFICATION AND ALLOWABLE LEAKAGE TABLE

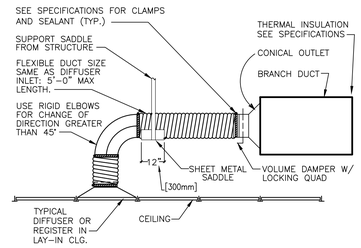
| DUCT PRESSURE CLASS, W.G. IN[mm] | SEAL CLASS | APPLICABLE SEALING | SMACNA LEAKAGE CLASS | |
|---|---|---|---|---|
| | | | RECTANGULAR DUCT | ROUND DUCT |
| 1/2", 1", 2" [13, 25, 51] | C | TRANSVERSE JOINTS ONLY | 24 | 12 |
| 4" [102] | A | JOINTS, SEAMS AND ALL WALL PENETRATIONS | 6 | 3 |



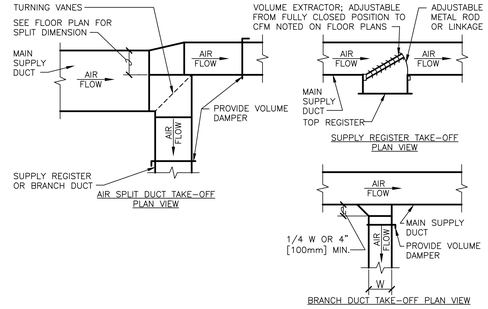

NOTE:

1. DELETE INSULATION STAND-OFF ON DUCTWORK WITHOUT EXTERIOR INSULATION.
2. DETAIL SHOWS SINGLE BLADE DAMPER. DAMPER INSTALLATION SHALL BE SIMILAR FOR MULTI-BLADE DAMPERS & ROUND DAMPERS.

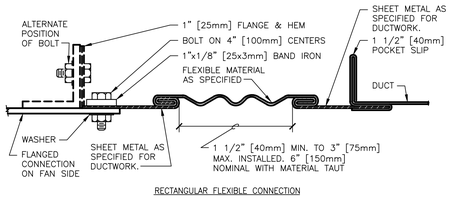
### 1 VOLUME DAMPER DETAIL
NTS



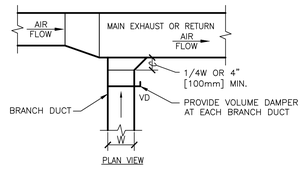

### 2 FLEXIBLE AIR DUCT CONNECTOR
NTS



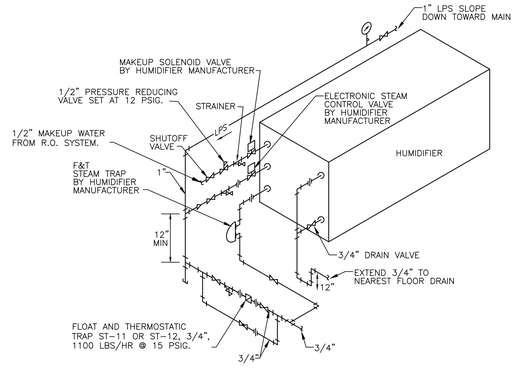

### 3 SUPPLY DUCTWORK TAKE-OFFS
NTS



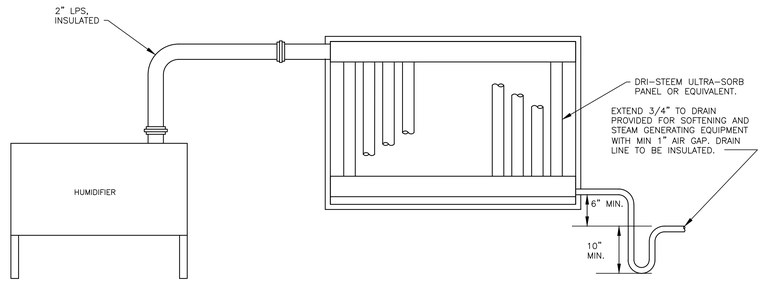

### 4 FLEXIBLE DUCT CONNECTIONS
NTS



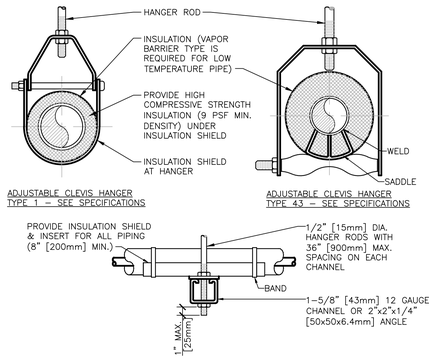

### 5 EXHAUST OR RETURN BRANCH DUCTWORK
NTS




### 6 STEAM HUMIDIFIER DETAIL
NTS

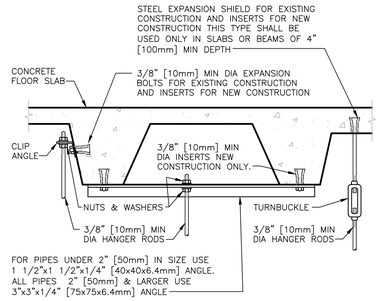



### 7 STEAM HUMIDIFIER MANIFOLD DETAIL
NTS

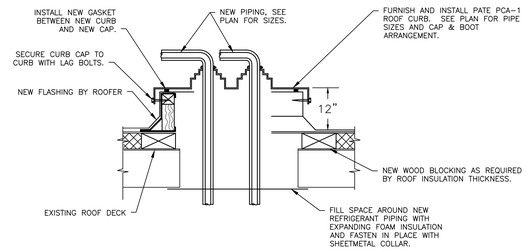



| MAXIMUM PIPE/TUBING SUPPORT SPACING | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NOM. SIZE IN. [mm] | | THRU 3/4 THRU [20] | 1 [25] | 1 1/4 [32] | 1 1/2 [40] | 2 [50] | 2 1/2 [65] | 3 [75] |
| PIPE | FT. [mm] | 7 [2100] | 7 [2100] | 7 [2100] | 9 [2700] | 10 [3000] | 11 [3400] | 12 [3700] |
| TUBING | FT. [mm] | 5 FT [1500] | 6 [1800] | 7 [2100] | 8 [2400] | 8 [2400] | 9 [2700] | 10 [3000] |
| NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE. | | | | | | | | |

### 8 PIPE HANGERS
NTS




### 9 SECURING HANGER RODS IN CONCRETE
NTS




### 11 ROOF CURB DETAIL
NTS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| APPROVED: | APPROVED: SERVICE LINE CHIEF | APPROVED: CHIEF OF STAFF<br>JOHN D. BERRYMAN, M. D. |

DRAWING TITLE: MECHANICAL DETAILS

PROJECT TITLE: HVAC NEGATIVE AIR CORRECTIONS

DATE 07/06/2012 | REV. | SCALE

DRAWING No. MH500

PROJECT No. 517-11-105

DRAWN BY: PDC

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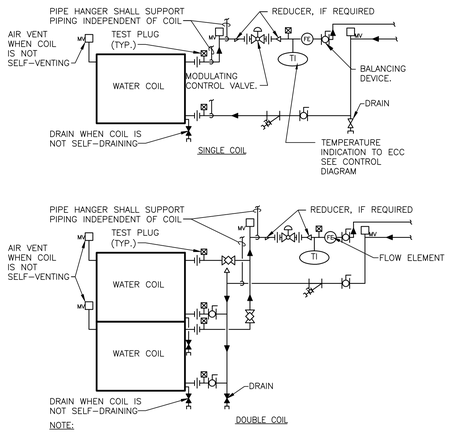
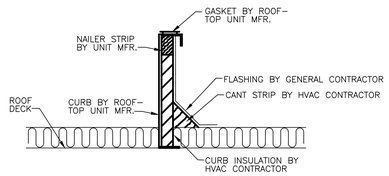



NOTE:

1. WHEN COIL IS INCLUDED IN CASING MOUNTED ON VIBRATION ISOLATORS THE FIRST 2 HANGERS FOR EACH PIPE SHALL BE SPRING & NEOPRENE TYPE. TYPE "H" FOR 4" [100mm]ø PIPE & SMALLER. TYPE "H-P" FOR 5" [125mm]ø PIPE & LARGER.
2. PIPING SHALL BE INSTALLED IN SUCH MANNER THAT IT WILL NOT BLOCK THE SWING OR USE OF ACCESS DOORS OR PANELS; NEITHER SHALL IT BLOCK THE SERVICING OF FILTERS, VALVES, OR EQUIPMENT.
3. THE FLOW ELEMENT MAY BE INSTALLED IN THE SUPPLY PIPING IF THE REQUIRED MINIMUM UPSTREAM AND DOWNSTREAM DIMENSIONS CANNOT BE OBTAINED IN THE RETURN PIPING.

## 12 WATER COILS - PIPING CONNECTIONS

NTS




## 15 ROOFTOP UNIT CURB DETAIL

NTS

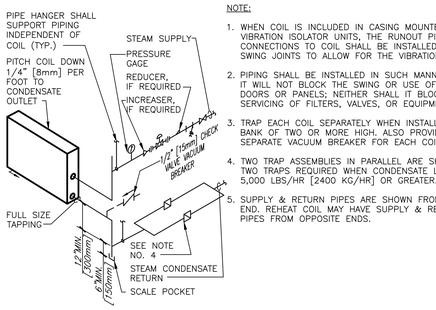
REMOVE PNEUMATIC OPERATOR AND ALL HARDWARE.

PERMANENTLY SEAL OFF PNEUMATIC CONTROL LINES AND TIE BACK TO CONDUIT.

REMOVE VORTEX VANE SECTION FROM RETURN AIR FAN AND DUCTWORK. REMOVE VANES, MOTOR-OPERATOR AND LINKAGE FROM SECTION. PLUG ALL HOLES IN VANE HOUSING AND REINSTALL ON FAN AND DUCTWORK.

## 14 RETURN FAN VORTEX VANE HOUSING MODIFICATION

NTS

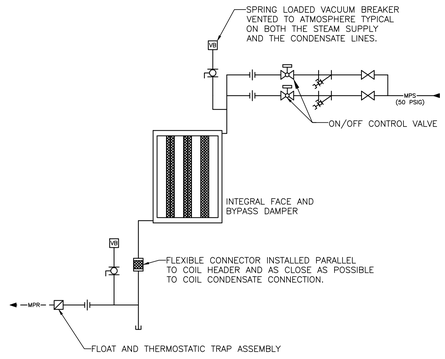



NOTE:

1. WHEN COIL IS INCLUDED IN CASING MOUNTED ON VIBRATION ISOLATOR UNITS, THE RUNOUT PIPING FOR CONNECTIONS TO COIL SHALL BE INSTALLED WITH SWING JOINTS TO ALLOW FOR THE VIBRATION.
2. PIPING SHALL BE INSTALLED IN SUCH MANNER THAT IT WILL NOT BLOCK THE SWING OR USE OF ACCESS DOORS OR PANELS; NEITHER SHALL IT BLOCK THE SERVICING OF FILTERS, VALVES, OR EQUIPMENT.
3. TRAP EACH COIL SEPARATELY WHEN INSTALLED IN A BANK OF TWO OR MORE HIGH. ALSO PROVIDE SEPARATE VACUUM BREAKER FOR EACH COIL.
4. TWO TRAP ASSEMBLIES IN PARALLEL ARE SHOWN. TWO TRAPS REQUIRED WHEN CONDENSATE LOAD IS 5,000 LBS/HR [2400 KG/HR] OR GREATER.
5. SUPPLY & RETURN PIPES ARE SHOWN FROM SAME END. REHEAT COIL MAY HAVE SUPPLY & RETURN PIPES FROM OPPOSITE ENDS.

## 16 STEAM COIL - PIPING CONNECTIONS

NTS




## INTEGRAL FACE AND BYPASS STEAM COIL DETAIL

## 17

NTS

| | | | |
|---|---|---|---|
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| APPROVED: INFECTION CONTROL<br><br>SHAWN M. MILLS | APPROVED: ASSOCIATE DIRECTOR for PATIENT CARE SERVICES/EXECUTIVE NURSE<br>DEBRA LEGG, RN, MSN | APPROVED: ASSOCIATE DIRECTOR<br><br>J. BRIAN NIMMO, MS | |
| APPROVED: | APPROVED: SERVICE LINE CHIEF | APPROVED: CHIEF OF STAFF<br><br>JOHN D. BERRYMAN, M. D. | DATE 07/06/2012 \| REV. \| SCALE |


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Building 1

| | |
|---|---|
| DRAWING No. | MH501 |
| PROJECT No. | 517-11-105 |
| DRAWN BY: | PDC |
| CHECKED BY: | JPA |

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## ROOFTOP UNIT SCHEDULE

| MARK | LOCATION | AREA AND/OR BLDG SERVED | TYPE | AIR FLOW | AIR FLOW | | | | | | SUPPLY FAN MARK | RETURN OR RELIEF FAN MARK | PREFILTER MARK | AFTER FILTER MARK | FINAL FILTER MARK | HOT GAS REHEAT COIL MARK | PREHEAT COIL MARK | COOLING COIL MARK | AIR COOLED CONDENSING UNIT MARK | ELECTRICAL | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | SUPPLY | | MIN OA | | RETURN | | | | | | | | | | | 460/3/60 | | |
| | | | | | CFM | [L/s] | CFM | [L/s] | CFM | [L/s] | | | | | | | | | | MCA | MOP | |
| 1-MAU-29 | ROOF | KITCHEN & BASEMENT | PRE-ENGINEERING | CV | 8000 | [ 3800 ] | 8000 | [ 3800 ] | 0 | [ ] | 1-SF29 | N/A | 1-PF29 | N/A | N/A | 1-HGR29 | 1-PHC29 | 1-DXCC29 | 1-ACCU29 | 79 | 100 | 1 |

## DIRECT EXPANSION COOLING COIL SCHEDULE

| MARK | LOCATION | AREA AND/OR BLDG SERVED | SYSTEM AND/OR SERVICE | AIR FLOW | | MAX FACE VELOCITY | | APD | | EAT | | | | LAT | | | | TOTAL CAPACITY | | SENSIBLE CAPACITY | | REFRIGERANT | SATURATED SUCTION TEMP | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Db | | Wb | | Db | | Wb | | | | | | | | | |
| | | | | CFM | [L/s] | FPM | [M/s] | IN WG | [Pa] | °F | [°C] | °F | [°C] | °F | [°C] | °F | [°C] | MBH | [kW] | MBH | [kW] | | °F | [°C] | |
| 1-DXCC29 | ROOF | KITCHEN & BASEMENT | 1-MAU-29 | 8000 | [ 3800 ] | 495 | [ 1 ] | 1.02 | 260 | 84.6 | [ 29 ] | 70 | [ 21 ] | 55 | [ 13 ] | 54 | [ 12 ] | 417.6 | [ 1400 ] | 267.2 | [ 910 ] | 410A | 45 | [ 7 ] | --- |

## AIR COOLED CONDENSING UNIT SECTION SCHEDULE

| MARK | LOCATION | AREA AND/OR BLDG SERVED | SYSTEM AND/OR SERVICE | TYPE | MIN REFRIGERATION | | REFRIGERANT | MAX SUCTION TEMP @ COMP | | OA TEMP | | MIN EER | COMPRESSOR MOTOR | | | CONDENSER FAN MOTOR | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | NOMINAL POWER | | | | |
| | | | | | MBH | [kW] | | °F | [°C] | °F | [°C] | | # COMP | PHASE | VOLT | # FANS | HP | [W] | PHASE | VOLT | |
| 1-ACCU29 | ROOF | KITCHEN & BASEMENT | 1-MAU-29 | DIGITAL SCROLL | 23 | [ 78 ] | 410A | 45 | [ 7 ] | 84.6 | [ 29 ] | 9.7 | 4 | 3 | 460 | 2 | 1.5 | [ 1100 ] | 3 | 460 | ----- |

## AIR HANDLING UNIT SCHEDULE

| MARK | LOCATION | AREA AND/OR BLDG SERVED | TYPE | AIR FLOW | AIR FLOW | | | | | | SUPPLY FAN MARK | RETURN OR RELIEF FAN MARK | EXHAUST FAN MARK | PREFILTER MARK | AFTER FILTER MARK | FINAL FILTER MARK | HEAT RECOVERY MARK | PREHEAT COIL MARK | COOLING COIL MARK | REHEAT COIL | HUMIDIFIER MARK | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | SUPPLY | | MIN OA | | RETURN | | | | | | | | | | | | | |
| | | | | | CFM | [L/s] | CFM | [L/s] | CFM | [L/s] | | | | | | | | | | | | |
| 1-MAU-14 | SOUTH 3rd FLR ROOF | 3/4 SOUTH | PRE-ENGINEERING | N/A | 8300 | [ 3900 ] | 8300 | [ 3900 ] | 0 | [ ] | 1-SF14 | N/A | N/A | 1-PF-14 | N/A | 1-FF-14 | N/A | 1-PHC14 | 1-CWCC14 | 1-RHC14 | 1-SH14 | ----- |
| 1-MAU-15 | NORTH 3rd FLR ROOF | 3/4 NORTH | PRE-ENGINEERING | N/A | 8300 | [ 3900 ] | 8300 | [ 3900 ] | 0 | [ ] | 1-SF15 | N/A | N/A | 1-PF-15 | N/A | 1-FF-15 | N/A | 1-PHC15 | 1-CWCC15 | 1-RHC15 | 1-SH15 | ----- |
| 1-MAU-30 | 7A-101 | 6 NORTH | PRE-ENGINEERING | | 1800 | [ 850 ] | 1800 | [ 850 ] | 0 | [ ] | 1-SF30 | N/A | 1-EF30 | 1-PF-30 | N/A | N/A | 2-RAHX30 | 1-PHC30 | 1-CWCC30 | | | |
| 1-MAU-31 | 7B-101 | 6 SOUTH | PRE-ENGINEERING | | 1800 | [ 850 ] | 1800 | [ 850 ] | 0 | [ ] | 1-SF31 | N/A | 1-FE31 | 1-PF-31 | N/A | N/A | 2-RAHX31 | 1-PHC31 | 1-CWCC31 | | | |

## FAN SCHEDULE

| MARK | LOCATION | AREA AND/OR BLDG SERVED | SYSTEM AND/OR SERVICE | AIR FLOW | | TSP | | FAN | | | | | | | | MOTOR ELECTRICAL | | | | | | CONTROL SEQUENCE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | TYPE | WHEEL | CLASS | ARRANGEMENT, ROTATION, AND DISCHARGE | DIAMETER | | MIN % EFF | DRIVE | FAN MAX RPM | NOMINAL POWER | | | PHASE | VOLT | RPM | SPEED CONTROL | | |
| | | | | | | | | | | | | | | | | | BHP | HP | [kW] | | | | | |
| | | | | CFM | [L/s] | IN | [Pa] | | | | | IN | [mm] | | | | | | | | | | | | |
| 1-SF14 | SOUTH 3rd FLR ROOF | 3/4 SOUTH | 1-MAU-14 | 8300 | [ 3900 ] | 5.5 | [ 1400 ] | REAR INLET INTEGRAL DIFF | AIRFOIL | II | | 18 | [ 450 ] | | BELT | 2923 | | 20 | [ 15 ] | 3 | 208 | 3600 | VARIABLE | | |
| 1-SF15 | NORTH 3rd FLR ROOF | 3/4 NORTH | 1-MAU-15 | 8300 | [ 3900 ] | 5.5 | [ 1400 ] | REAR INLET INTEGRAL DIFF | AIRFOIL | II | | 18 | [ 450 ] | | BELT | 2923 | | 20 | [ 15 ] | 3 | 208 | 3600 | VARIABLE | | |
| 1-SF29 | ROOF | KITCHEN BASEMENT | 1-MAU-29 | 8000 | [ 3800 ] | 3.4 | [ 850 ] | DOUBLE WIDTH DOUBLE INLET | BAE-DW | II | ARR 3, CW ROTATION, THD DISCHARGE | 16.5 | [ 410 ] | 69.30 | BELT | 2814 | 9.53 | 15 | [ 11 ] | 3 | 460 | 3600 | | | |
| 1-SF30 | 7A-101 | 6th NORTH | 1-MAU-30 | 1400 | [ 660 ] | 5 | [ 1300 ] | UPBLAST CENTRIFUGAL | FORWARD CURVE | II | | | [ ] | | BELT | 2561 | | 3 | [ 2 ] | 3 | 208 | 1800 | VARIABLE | | |
| 1-EF30 | 7A-101 | 6th NORTH | 1-MAU-30 | 1400 | [ 660 ] | 1.5 | [ 380 ] | UPBLAST CENTRIFUGAL | FORWARD CURVE | II | | | [ ] | | BELT | 2150 | | 2 | [ 2 ] | 3 | 208 | 1800 | VARIABLE | | |
| 1-SF31 | 7B-101 | 6th NORTH | 1-MAU-31 | 1400 | [ 660 ] | 5 | [ 1300 ] | UPBLAST CENTRIFUGAL | FORWARD CURVE | II | | | [ ] | | BELT | 2561 | | 3 | [ 2 ] | 3 | 208 | 1800 | VARIABLE | | |
| 1-EF31 | 7A-101 | 6th NORTH | 1-MAU-31 | 1400 | [ 660 ] | 1.5 | [ 380 ] | UPBLAST CENTRIFUGAL | FORWARD CURVE | II | | | [ ] | | BELT | 2150 | | 2 | [ 2 ] | 3 | 208 | 1800 | VARIABLE | | |

## CHILLED WATER COOLING COIL SCHEDULE

| MARK | LOCATION | AREA AND/OR BLDG SERVED | SYSTEM AND/OR SERVICE | AIR FLOW | | MAX FACE VELOCITY | | APD | | EAT | | | | LAT | | | | TOTAL CAPACITY | | SENSIBLE CAPACITY | | CHILLED WATER | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Db | | Wb | | Db | | Wb | | | | | | FLOW | | EWT | | LWT | | WPD | |
| | | | | CFM | [L/s] | FPM | [M/s] | IN WG | [Pa] | °F | [°C] | °F | [°C] | °F | [°C] | °F | [°C] | MBH | [kW] | MBH | [kW] | GPM | [L/s] | °F | [°C] | °F | [°C] | FT | [M] | |
| 1-CWCC6 | 2A-145 | 2nd AREA AB | AHU-6 | 6370 | [ 3000 ] | 448 | [ 2 ] | 0.44 | [ 110 ] | 79.5 | [ 26 ] | 67.4 | [ 20 ] | 57.7 | [ 14 ] | 56.9 | [ 14 ] | 212.2 | [ 62 ] | 153.3 | [ 45 ] | 42.3 | [ 3 ] | 45 | [ 7 ] | 55 | [ 13 ] | 1.7 | [ 1 ] | |
| 1-CWCC8a | 3B-113A | 2nd AREA B | AHU-8 | 4745 | [ 2200 ] | 552 | [ 3 ] | 0.79 | [ 200 ] | 82.8 | [ 28 ] | 68.4 | [ 20 ] | 57.4 | [ 14 ] | 56.7 | [ 14 ] | 177.3 | [ 52 ] | 132.9 | [ 39 ] | 35.3 | [ 2 ] | 45 | [ 7 ] | 55 | [ 13 ] | 3.14 | [ 1 ] | |
| 1-CWCC8b | 3B-113A | 2nd AREA B | AHU-8 | 4745 | [ 2200 ] | 552 | [ 3 ] | 0.79 | [ 200 ] | 82.8 | [ 28 ] | 68.4 | [ 20 ] | 57.4 | [ 14 ] | 56.7 | [ 14 ] | 177.3 | [ 52 ] | 132.9 | [ 39 ] | 35.3 | [ 2 ] | 45 | [ 7 ] | 55 | [ 13 ] | 3.14 | [ 1 ] | |
| 1-CWCC10 | 3A-111A | 2nd AREA A | AHU-10 | 5300 | [ 2500 ] | 431 | [ 2 ] | 0.45 | [ 110 ] | 80.4 | [ 27 ] | 70 | [ 21 ] | 58.4 | [ 15 ] | 57.9 | [ 14 ] | 212.2 | [ 62 ] | 128.8 | [ 38 ] | 42.3 | [ 3 ] | 45 | [ 7 ] | 55 | [ 13 ] | 3.69 | [ 1 ] | |
| 1-CWCC14 | SOUTH 3rd FLR ROOF | 3/4 AREA B | MAU-14 | 8300 | [ 3900 ] | 490 | [ 3 ] | 0.83 | [ 210 ] | 84.6 | [ 29 ] | 69.8 | [ 21 ] | 53.6 | [ 12 ] | 53.4 | [ 12 ] | 419 | [ 120 ] | 266.5 | [ 75 ] | 83.8 | [ 5 ] | 44 | [ 7 ] | 54 | [ 12 ] | 5.8 | [ 2 ] | |
| 1-CWCC15 | NORTH 3rd FLR ROOF | 3/4 AREA A | MAU-15 | 8300 | [ 3900 ] | 490 | [ 3 ] | 0.83 | [ 210 ] | 84.6 | [ 29 ] | 69.8 | [ 21 ] | 53.6 | [ 12 ] | 53.4 | [ 12 ] | 419 | [ 120 ] | 266.5 | [ 75 ] | 83.8 | [ 5 ] | 44 | [ 7 ] | 54 | [ 12 ] | 5.8 | [ 2 ] | |
| 1-CWCC30 | 7A101 | 6th NORTH | MAU-30 | 1400 | [ 660 ] | 404 | [ 2 ] | 0.43 | [ 110 ] | 75.1 | [ 24 ] | 62.9 | [ 17 ] | 54.9 | [ 13 ] | 54 | [ 12 ] | 35.1 | [ 10 ] | 28.2 | [ 8 ] | 7 | [ .4 ] | 44 | [ 7 ] | 54 | [ 12 ] | 0.9 | [ .3 ] | |
| 1-CWCC31 | 7B101 | 6th SOUTH | MAU-31 | 1400 | [ 660 ] | 404 | [ 2 ] | 0.43 | [ 110 ] | 75.1 | [ 24 ] | 62.9 | [ 17 ] | 54.9 | [ 13 ] | 54 | [ 12 ] | 35.1 | [ 10 ] | 28.2 | [ 8 ] | 7 | [ .4 ] | 44 | [ 7 ] | 54 | [ 12 ] | 0.9 | [ .3 ] | |

## STEAM HEATING COIL SCHEDULE

| MARK | LOCATION | AREA AND/OR BLDG SERVED | SYSTEM AND/OR SERVICE | APPLICATION | AIR FLOW | | MAX FACE VELOCITY | | APD | | TEMPERATURES | | | | TOTAL MIN CAPACITY | | STEAM | | | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | EAT | | LAT | | | | ENT CONT VALVE | | ENT COIL | | FLOW | | STEAM TRAP | | | |
| | | | | | CFM | [L/s] | FPM | [M/s] | IN WG | [Pa] | °F | [°C] | °F | [°C] | MBH | [kW] | PSIG | [kPa] | PSIG | [kPa] | LBS/HR | [kg/HR] | MARK | LBS/HR | [kg/HR] | |
| 1-PHC6 | 2A-145 | 2nd AREA AB | AHU-6 | | 6370 | [ 3000 ] | 659 | 3.3 | 0.13 | [ 33 ] | 41.9 | [ 6 ] | 71.2 | [ 22 ] | 202.4 | [ 690 ] | | [ ] | 5 | [ 35 ] | 211 | [ 96 ] | ST-1 | 633 | [ 290 ] | |
| 1-PHC8 | 3B-113A | 2nd AREA B | AHU-8 | | 9,490 | [ 4500 ] | 627 | 3.2 | 0.19 | [ 48 ] | 9.1 | [ -13 ] | 60 | [ 16 ] | 523.9 | [ 1800 ] | | [ ] | 5 | [ 35 ] | 544 | [ 250 ] | ST-2 | 1632 | [ 740 ] | |
| 1-PHC10 | 3A-111A | 2nd AREA A | AHU-10 | | 5,300 | [ 2500 ] | 589 | 3 | 0.12 | [ 30 ] | 23.9 | [ -5 ] | 60 | [ 16 ] | 207.5 | [ 710 ] | | [ ] | 5 | [ 35 ] | 216 | [ 98 ] | ST-3 | 648 | [ 290 ] | |
| 1-PHC14 | SOUTH 3rd FLR ROOF | 3/4 AREA B | MAU-14 | | 8,300 | [ 3900 ] | 902 | 4.6 | 0.59 | [ 150 ] | 5 | [ -15 ] | 71 | [ 22 ] | 595.0 | [ 2000 ] | | [ ] | 50 | [ 350 ] | 641 | [ 290 ] | ST-4 | 1932 | [ 880 ] | 1 |
| 1-RHC14 | SOUTH 3rd FLR ROOF | 3/4 AREA B | MAU-14 | | 8,300 | [ 3900 ] | 613 | 3.1 | 0.13 | [ 33 ] | 55 | [ 13 ] | 104.4 | [ 40 ] | 404.2 | [ 1400 ] | | [ ] | 50 | [ 350 ] | 435 | [ 200 ] | ST-5 | 1305 | [ 590 ] | |
| 1-PHC15 | NORTH 3rd FLR ROOF | 3/4 AREA A | MAU-15 | | 8300 | [ 3900 ] | 902 | 4.6 | 0.59 | [ 150 ] | 5 | [ -15 ] | 71 | [ 22 ] | 595.0 | [ 2000 ] | | [ ] | 50 | [ 350 ] | 640 | [ 290 ] | ST-6 | 1920 | [ 870 ] | 1 |
| 1-RHC15 | NORTH 3rd FLR ROOF | 3/4 AREA A | MAU-15 | | 8300 | [ 3900 ] | 613 | 3.1 | 0.13 | [ 33 ] | 55 | [ 13 ] | 104.4 | [ 40 ] | 404.2 | [ 1400 ] | | [ ] | 50 | [ 350 ] | 435 | [ 200 ] | ST-7 | 1305 | [ 590 ] | |
| 1-PHC29 | ROOF | KITCHEN & BASEMENT | MAU-29 | | 8000 | [ 3800 ] | 566 | 2.9 | 0.17 | [ 43 ] | 5.5 | [ -15 ] | 70 | [ 21 ] | 556.7 | [ 1900 ] | | [ ] | 50 | [ 350 ] | 599 | [ 270 ] | ST-8 | 1797 | [ 820 ] | 1 |
| 1-RHC30 | 7A101 | 6th NORTH | MAU-30 | | 1,400 | [ 660 ] | 420 | 2.1 | 0.03 | [ 8 ] | 47.1 | [ 8 ] | 108.9 | [ 43 ] | 93.9 | [ 320 ] | | [ ] | 50 | [ 350 ] | 92 | [ 42 ] | ST-9 | 276 | [ 130 ] | |
| 1-RHC31 | 7B101 | 6th SOUTH | MAU-31 | | 1400 | [ 660 ] | 420 | 2.1 | 0.03 | [ 8 ] | 47.1 | [ 8 ] | 108.9 | [ 43 ] | 93.9 | [ 320 ] | | [ ] | 50 | [ 350 ] | 92 | [ 42 ] | ST-11 | 276 | [ 130 ] | |

1. INTEGRAL FACE AND BYPASS.

## HVAC DESIGN DATA

| DESIGN CONDITIONS | SUMMER | | | | | WINTER | | | | | LOWEST AVERAGE ANNUAL DEWPOINT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TEMP | | WET BULB TEMP | | % HUMIDITY | TEMP | | DEWPOINT TEMP | | % HUMIDITY | | |
| | °F | [°C] | °F | [°C] | | °F | [°C] | °F | [°C] | | °F | [°C] |
| OUTDOOR DESIGN CONDITIONS | 84.6 | [ 29 ] | 69.8 | [ 21 ] | 46 | 5.5 | [ -15 ] | -3.2 | [ -20 ] | NA | 1.5 | [ -17 ] |
| INDOOR AREA DESIGN CONDITIONS | | | | | | | | | | | | |
| PATIENT ROOM | 75 | [ 24 ] | 62 | [ 17 ] | 50 | 70 | [ 21 ] | 32 | 0 | 25 | | |
| OFFICE | 75 | [ 24 ] | 62 | [ 17 ] | 50 | 70 | [ 21 ] | 32 | 0 | 25 | | |
| CORRIDOR | 75 | [ 24 ] | 62 | [ 17 ] | 50 | 70 | [ 21 ] | 32 | 0 | 25 | | |
| | | | | | | | | | | | | |

## HOT GAS REHEAT COIL SCHEDULE

| MARK | LOCATION | AREA AND/OR BLDG SERVED | SYSTEM AND/OR SERVICE | APD | | EAT | | LAT | | TOTAL CAPACITY | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Db | | Db | | | | |
| | | | | IN WG | [Pa] | °F | [°C] | °F | [°C] | MBH | [kW] | |
| 1-HGR29 | ROOF | KITCHEN & BASEMENT | 1-MAU-29 | 0.2 | 50 | 55 | [ 13 ] | 70 | [ 21 ] | 147 | [ 500 ] | --- |

Building 1

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APPROVED: SAFETY MANAGER
JUSTIN GREENE

APPROVED: INFECTION CONTROL
SHAWN M. MILLS

APPROVED:

APPROVED: CHIEF, FACILITIES MANAGEMENT SERVICE LINE
CLAYTON HELMS, CHFM

APPROVED: ASSOCIATE DIRECTOR for PATIENT CARE SERVICES/EXECUTIVE NURSE
DEBRA LEGG, RN, MSN

APPROVED: SERVICE LINE CHIEF

APPROVED: MEDICAL CENTER DIRECTOR
KARIN L. McGRAW, MSN, FACHE

APPROVED: ASSOCIATE DIRECTOR
J. BRIAN NIMMO, MS

APPROVED: CHIEF OF STAFF
JOHN D. BERRYMAN, M. D.

DRAWING TITLE: MECHANICAL SCHEDULES
PROJECT TITLE: HVAC NEGATIVE AIR CORRECTIONS
DATE 07/06/2012 | REV. | SCALE

DRAWING No. MH600
PROJECT No. 517-11-105
DRAWN BY: PDC
CHECKED BY: JPA

Veterans Affairs Medical Center
200 Veterans Av
Beckley, WV.
25801

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## AIR DEVICE SCHEDULE

| MARK | TYPE | AIR FLOW MIN CFM | AIR FLOW MIN [L/s] | AIR FLOW MAX CFM | AIR FLOW MAX [L/s] | MAX APD IN W.G | MAX APD [Pa] | MOUNTING | PANEL/FRAME SIZE IN x IN | PANEL/FRAME SIZE [mm x mm] | NECK SIZE IN | NECK SIZE [mm ] | NC | DAMPER | FINISH | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SD-1 | LOUVERED FACE | 1400 | [ 660 ] | 1400 | [ 660 ] | 0.180 | [ 45 ] | CEILING LAY-IN | 24x24 | 610x610 | 18x18 | 457x457 | 32 | NONE | WHITE | 1, 2, 3 |
| EG-2 | EGG CRATE | 1700 | [ 800 ] | 1700 | [ 800 ] | 0.130 | [ 33 ] | CEILING LAY-IN | 24x24 | 610x610 | 22x22 | 559x559 | 19 | NONE | WHITE | 4 |
| SD-3 | THREE CONES | 40 | [ 19 ] | 100 | [ 47 ] | 0.025 | [ 6 ] | CEILING LAY-IN | 24x24 | 610x610 | 6"Ø | 155ø | <10 | NONE | WHITE | 1,5 |
| SG-4 | PERFORATED | 670 | [ 320 ] | 670 | [ 320 ] | | | WALL SURFACE MTD | 12x48 | 305x1220 | FULL | FULL | | NONE | WHITE | 2, 6 |
| SG-5 | SNGL DEFLECTION | 1970 | [ 930 ] | 1970 | [ 930 ] | | | CEILING LAY-IN | 24x48 | 610x1220 | 22x46 | 559x1168 | | NONE | WHITE | 7 |

**NOTES:**

1. SEE FLOOR PLAN FOR THROW PATTERN.
2. 1-WAY THROW PATTERN.
3. BASIS OF DESIGN: TITUS MODEL TDC.
4. BASIS OF DESIGN: TITUS MODEL 50F.
5. BASIS OF DESIGN: TITUS MODEL TMS.
6. BASIS OF DESIGN: TITUS MODEL 8R.
7. BASIS OF DESIGN: TITUS MODEL 301RS.

## STEAM HUMIDIFER SCHEDULE

| MARK | LOCATION | SYSTEM AND/OR SEVICE | HUMIDIFIER TYPE | AIR FLOW CFM | AIR FLOW [L/s] | # OF MANIFOLDS | EAT Db °F | EAT Db [°C] | EAT Wb °F | EAT Wb [°C] | EAT DEWPOINT °F | EAT DEWPOINT [°C] | LAT DEWPOINT °F | LAT DEWPOINT [°C] | SOURCE | STEAM PRESS ENT VALVE PSIG | STEAM PRESS ENT VALVE [kPa] | STEAM PRESS ENT HEATER PSIG | STEAM PRESS ENT HEATER [kPa] | STEAM FLOW LBS/HR | STEAM FLOW [kg/HR] | CONTROL TYPE | TRAP MARK | TRAP CAPACITY LBS/HR | TRAP CAPACITY [kg/HR] | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-SH-14 | 3B-110 | 1-MAU-14 | DUCT MOUNTED DISPERSION TUBE | 8300 | [ 3900 ] | 1 ULTRA-SORB LV 54"x16" FACE DIMENSION | 70 | 21 | 45 | 7 | 0 | -18 | 32 | 0 | CLEAN STEAM | 50 | 350 | 15 | 100 | 130 | 59 | | ST-11 | 390 | [ 180 ] | DRI-STEEM MODEL STS-100S |
| 1-SH-15 | 3A-111A | 1-MAU-15 | DUCT MOUNTED DISPERSION TUBE | 8300 | [ 3900 ] | 1 ULTRA-SORB LV 54"x16" FACE DIMENSION | 70 | 21 | 45 | 7 | 0 | -18 | 32 | 0 | CLEAN STEAM | -- | | 15 | 100 | 130 | 59 | | ST-12 | 390 | [ 180 ] | DRI-STEEM MODEL STS-100S |

## ROTARY AIR TO AIR HEAT RECOVERY WHEEL SCHEDULE

| MARK | LOCATION | SYSTEM AND/OR SERVICE | MODE | SUPPLY AIR FLOW CFM | SUPPLY AIR FLOW [L/s] | SUPPLY APD IN | SUPPLY APD [Pa] | SUPPLY EAT Db °F | SUPPLY EAT Db [°C] | SUPPLY EAT Wb °F | SUPPLY EAT Wb [°C] | SUPPLY LAT Db °F | SUPPLY LAT Db [°C] | SUPPLY LAT Wb °F | SUPPLY LAT Wb [°C] | EXHAUST AIR FLOW CFM | EXHAUST AIR FLOW [L/s] | EXHAUST APD IN | EXHAUST APD [mm] | EXHAUST EAT Db °F | EXHAUST EAT Db [°C] | EXHAUST EAT Wb °F | EXHAUST EAT Wb [°C] | EXHAUST LAT Db °F | EXHAUST LAT Db [°C] | EXHAUST LAT Wb °F | EXHAUST LAT Wb [°C] | ROTOR MOTOR HP | ROTOR MOTOR [kW] | ROTOR MOTOR PHASE | ROTOR MOTOR VOLT | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-RAHX30 | 7A101 | 1-MAU-30 | SUMMER | 1400 | [ 660 ] | 1.02 | [ 75 ] | 84.6 | [ 29 ] | 69.8 | [ 21 ] | 75.1 | [ 24 ] | 62.9 | [ 17 ] | 1350 | [ 640 ] | 0.99 | [ 25 ] | 70 | [ 21 ] | 58 | [ 14 ] | | | | | 0.35 | [ ] | 1 | 115 | 1 |
| | | | WINTER | 1400 | [ 660 ] | 1.02 | [ 26 ] | 5.5 | [ -15 ] | 5.5 | [ -15 ] | 47.1 | [ 8 ] | 42.9 | [ 6 ] | 1350 | [ 640 ] | 0.99 | [ 25 ] | 70 | [ 21 ] | 58 | [ 14 ] | | | | | | | | | |
| 2-RAHX31 | 7B101 | 1-MAU-31 | SUMMER | 1400 | [ 660 ] | 1.02 | [ 75 ] | 84.6 | [ 29 ] | 69.8 | [ 21 ] | 75.1 | [ 24 ] | 62.9 | [ 17 ] | 1350 | [ 640 ] | 0.99 | [ 25 ] | 70 | [ 21 ] | 58 | [ 14 ] | | | | | 0.35 | [ ] | 1 | 115 | 1 |
| | | | WINTER | 1400 | [ 660 ] | 1.02 | [ 26 ] | 5.5 | [ -15 ] | 5.5 | [ -15 ] | 47.1 | [ 8 ] | 42.9 | [ 6 ] | 1350 | [ 640 ] | 0.99 | [ 25 ] | 70 | [ 21 ] | 58 | [ 14 ] | | | | | | | | | |

**NOTE:**

1. 3KW, 460 VOLT, 3 PHASE ELECTRIC HEAT SECTION FOR DEFROST

## BUILDING • STEAM TRAP SCHEDULE

| MARK | LOCATION | SYSTEM AND/OR SERVICE | CAPACITY AT MIN DIFF PRESS LBS/HR | CAPACITY AT MIN DIFF PRESS [kg/HR] | MIN DIFF PRESS PSI | MIN DIFF PRESS [kPa] | MIN INLET PRESS PSI | MIN INLET PRESS [kPa] | TRAP TYPE | TRAP SIZE IN | TRAP SIZE [mm] | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ST-1 | 2A-145 | AHU-6 | 633 | [ 290 ] | 2 | [ 14 ] | 2 | [ 14 ] | F & T | 1.0 | [ 25 ] | SPENCE, MODEL FTN-15 |
| ST-2 | 3B-113A | AHU-8 | 1632 | [ 740 ] | 2 | [ 14 ] | 2 | [ 14 ] | F & T | 1.5 | [ 38 ] | SPENCE, MODEL FTN-15 |
| ST-3 | 3A-111A | AHU-10 | 648 | [ 290 ] | 2 | [ 14 ] | 2 | [ 14 ] | F & T | 1.0 | [ 25 ] | SPENCE, MODEL FTN-15 |
| ST-4 | SOUTH 3rd FLR ROOF | MAU-14 PHC | 1932 | [ 880 ] | 10 | [ 69 ] | 40 | [ 280 ] | F & T | 1.25 | [ 31 ] | SPENCE, MODEL FTN-75 |
| ST-5 | SOUTH 3rd FLR ROOF | MAU-14 RHC | 1305 | [ 590 ] | 10 | [ 69 ] | 40 | [ 280 ] | F & T | 1.25 | [ 31 ] | SPENCE, MODEL FTN-75 |
| ST-6 | NORTH 3rd FLR ROOF | MAU-15 PHC | 1920 | [ 870 ] | 10 | [ 69 ] | 40 | [ 280 ] | F & T | 1.25 | [ 31 ] | SPENCE, MODEL FTN-75 |
| ST-7 | NORTH 3rd FLR ROOF | MAU-15 RHC | 1305 | [ 590 ] | 10 | [ 69 ] | 40 | [ 280 ] | F & T | 1.25 | [ 31 ] | SPENCE, MODEL FTN-75 |
| ST-8 | KITCHEN ROOF | MAU-29 | 1797 | [ 820 ] | 101 | [ 700 ] | 40 | [ 280 ] | F & T | 1.25 | [ 31 ] | SPENCE, MODEL FTN-75 |
| ST-9 | 7A101 | MAU-30 | 276 | [ 130 ] | 10 | [ 69 ] | 40 | [ 280 ] | F & T | .75 | [ 19 ] | SPENCE, MODEL FTN-75 |
| ST-10 | 7B101 | MAU-31 | 276 | [ 130 ] | 10 | [ 69 ] | 40 | [ 280 ] | F & T | .75 | [ 19 ] | SPENCE, MODEL FTN-75 |

## BUILDING • STEAM PRESSURE REDUCING VALVE SCHEDULE

| MARK | LOCATION | SYSTEM AND/OR SERVICE | QUANTITY | REQUIRED CAPACITY LBS/HR | REQUIRED CAPACITY [kg/HR] | MAX FLOW WIDE OPEN VALVE LBS/HR | MAX FLOW WIDE OPEN VALVE [kg/HR] | PRESSURE IN PSIG | PRESSURE IN [kPa] | PRESSURE OUT PSIG | PRESSURE OUT [kPa] | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-SPRV1 | 3B-110 | 1-SH-14 | 1 | 130 | [ 59 ] | 165 | [ 75 ] | 50 | [ 350 ] | 15 | [ 100 ] | SPENCE MODEL ED, Cv=1.5, NORMAL PORT |
| 1-SPRV2 | 3B-111A | 1-SH-15 | 1 | 130 | [ 59 ] | 165 | [ 75 ] | 50 | [ 350 ] | 15 | [ 100 ] | SPENCE MODEL ED, Cv=1.5, NORMAL PORT |

## AIR FILTER SCHEDULE

| MARK | LOCATION | AREA AND/OR BLDG SERVED | SYSTEM AND/OR SERVICE | MERV RATING | AIR FLOW CFM | AIR FLOW [L/s] | APD INITIAL IN | APD INITIAL [mm] | APD CHANGEOVER IN | APD CHANGEOVER [mm] | HOUSING TYPE | CARTRIDGES # | CARTRIDGES SIZE IN | CARTRIDGES SIZE [mm] | ARRANGEMENT | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-PF-14 | 3B-110 | 3/4 SOUTH | 1-MAU-14 | 7 | 8300 | [ 3900 ] | | | | | SIDE | | | | | |
| 1-AF-14 | 3B-110 | 3/4 SOUTH | 1-MAU-14 | 14 | 8300 | [ 3900 ] | | | | | SIDE | | | | | |
| 1-PF-15 | 3A-111A | 3/4 NORTH | 1-MAU-15 | 7 | 8300 | [ 3900 ] | | | | | SIDE | | | | | |
| 1-AF-15 | 3A-111A | 3/4 NORTH | 1-MAU-15 | 14 | 8300 | [ 3900 ] | | | | | SIDE | | | | | |
| 1-PF-29 | BASEMENT ROOF | KITCHEN & BASEMENT | 1-MAU-29 | 14 | 8000 | [ 3800 ] | | | | | SIDE | | | | | |
| 1-PF-30 | 7A-101 | 6th NORTH | 1-MAU-30 | 14 | 1400 | [ 660 ] | | | | | SIDE | | | | | |
| 1-PF-31 | 7B-101 | 6th SOUTH | 1-MAU-31 | 14 | 1400 | [ 660 ] | | | | | SIDE | | | | | |

## INTAKE LOUVER SCHEDULE

| MARK | LOCATION | SYSTEM AND/OR SERVICE | TYPE | APPLICATION | THROAT SIZE IN | THROAT SIZE [mm] | AIR FLOW CFM | AIR FLOW [L/s] | APD IN | APD [Pa] | DAMPER TYPE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-LOUV-1 | PENTHOUSE NORTH | MAU-30 | STATIONARY | INTAKE | 48" W 32" H | 1219.2 W 812.8 H | 1800 | [ 850 ] | 0.03 | [ 8 ] | N/A | |
| 1-LOUV-2 | PENTHOUSE SOUTH | MAU-31 | STATIONARY | INTAKE | 48" W 32" H | 1219.2 W 812.8 H | 1800 | [ 850 ] | 0.03 | [ 8 ] | N/A | |
| | | | | | | | | [ ] | | [ ] | | |
| | | | | | | | | [ ] | | [ ] | | |

Building 1

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| | | |
|---|---|---|
| APPROVED: SAFETY MANAGER<br>JUSTIN GREENE | APPROVED: CHIEF, FACILITIES MANAGEMENT SERVICE LINE<br>CLAYTON HELMS, CHFM | APPROVED: MEDICAL CENTER DIRECTOR<br>KARIN L. McGRAW, MSN, FACHE |
| APPROVED: INFECTION CONTROL<br>SHAWN M. MILLS | APPROVED: ASSOCIATE DIRECTOR for PATIENT CARE SERVICES/EXECUTIVE NURSE<br>DEBRA LEGG, RN, MSN | APPROVED: ASSOCIATE DIRECTOR<br>J. BRIAN NIMMO, MS |
| APPROVED: | APPROVED: SERVICE LINE CHIEF | APPROVED: CHIEF OF STAFF<br>JOHN D. BERRYMAN, M. D. |

DRAWING TITLE: MECHANICAL SCHEDULES
PROJECT TITLE: HVAC NEGATIVE AIR CORRECTIONS
DATE 07/06/2012 | REV. | SCALE

DRAWING No. MH601
PROJECT No. 517-11-105
DRAWN BY: PDC
CHECKED BY: JPA

Veterans Affairs Medical Center
200 Veterans Av
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# SEQUENCE OF OPERATION FOR MAKE-UP AIR UNIT AND HUMIDIFIER (1-MAU-14)

1. GENERAL

_1.1 UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE ECC. H-O-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF" D-1 SHALL BE FULLY CLOSED. WHEN THE UNIT IS "ON" D-1 SHALL BE FULLY OPEN. A DAMPER ENDSWITCH SHALL PREVENT SUPPLY FAN FROM STARTING UNTIL DAMPER IS 50% OPEN.

2. TEMPERATURE CONTROL

_2.1 THE PREHEAT VALVE V-2 SHALL CONSIST OF TWO VALVES (A & B) SIZED FOR 1/3 AND 2/3 (RESPECTIVELY) OF THE TOTAL CAPACITY. THE PAIR SHALL OPERATE IN SEQUENCE WITH THE SMALLER VALVE OPENING FIRST. PROVIDE ANALOG FEEDBACK SIGNAL FOR EACH VALVE TO MONITOR VALVE POSITION.

2.2 PREHEAT COIL IF THE OUTSIDE AIR TEMPERATURE (AS MEASURED BY TT-1) IS BELOW 35°F [1.7°C]. STEAM VALVE V-2 SHALL GO TO FULL OPEN AND THE PREHEAT COIL FACE-AND-BYPASS DAMPER (D-2) SHALL MODULATE TO MAINTAIN A TEMPERATURE SETPOINT OF 55°F (AS MEASURED BY TT-2) WHICH IS ADJUSTABLE.

2.3 PREHEAT COIL IF THE OUTSIDE AIR TEMPERATURE (AS MEASURED BY TT-1) IS GREATER THAN 55°F: STEAM VALVE V-2 SHALL GO TO FULL CLOSED AND THE PREHEAT COIL FACE-AND-BYPASS DAMPER (D-2) SHALL GO TO FULL BYPASS.

2.4 PREHEAT COIL IF THE OUTSIDE AIR TEMPERATURE (AS MEASURED BY TT-1) IS BETWEEN 35°F AND 55°F: THE PREHEAT COIL FACE-AND-BYPASS DAMPER (D-2) SHALL GO OPEN TO FULL AIRFLOW ACROSS THE FACE OF THE COIL AND STEAM VALVE V-2 SHALL MODULATE TO MAINTAIN A TEMPERATURE SETPOINT OF 55°F (AS MEASURED BY TT-2) WHICH IS ADJUSTABLE.

2.5 COOLING COIL: MODULATE CHILLED WATER VALVE V-1 TO MAINTAIN A TEMPERATURE SETPOINT OF 55°F (AS MEASURED BY TT-3) WHICH IS ADJUSTABLE. PROVIDE ANALOG FEEDBACK SIGNAL FOR V-1 TO MONITOR VALVE POSITION.

2.6 REHEAT COIL: MODULATE STEAM VALVE V-3 TO MAINTAIN A TEMPERATURE SETPOINT OF 70°F (AS MEASURED BY TT-5) WHICH IS ADJUSTABLE. PROVIDE ANALOG FEEDBACK SIGNAL FOR V-3 TO MONITOR VALVE POSITION.

3. AIR FLOW CONTROL

_3.1 THE MAKE-UP AIR FLOW SHALL BE CONTROLLED BY THE DIGITAL CONTROL PANEL MODULATING THE SUPPLY FAN'S VARIABLE SPEED MOTOR CONTROLLER TO MAINTAIN 8,300 CFM (FIELD ADJUSTABLE), SENSED BY FT-1.

3.2 HIGH PRESSURE SWITCH SPS-1 LOCATED AT THE SUPPLY FAN DISCHARGE SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 2" [75mm] OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT SPS-1 DOES EXCEED 2" [75mm] THE SUPPLY AIR FAN SHALL STOP. SPS-1 SHALL BE HARDWIRED TO THE SUPPLY FAN'S VARIABLE SPEED MOTOR CONTROLLER (STARTING DEVICE) AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. SPS-1 WILL REQUIRE MANUAL RESET AT THE DEVICE.

4. HUMIDITY CONTROL

_4.1 WHEN THE DIRECT DIGITAL CONTROL PANEL IS NOT CALLING FOR HUMIDITY, SENSED BY MAKE-UP AIR HUMIDITY SENSOR H-1, 2-WAY "ON-OFF" CONTROL VALVE V-4 SHALL REMAIN CLOSED. WHEN THE DIGITAL CONTROL PANEL IS CALLING FOR HUMIDITY, V-4 SHALL REMAIN OPEN. WHEN THE OUTSIDE AIR TEMPERATURE TT-1 IS ABOVE 55°F, V-4 SHALL BE CLOSED. WHEN THE SUPPLY FAN IS OFF, V-4 SHALL BE CLOSED.

4.2 MAKE-UP AIR HUMIDITY SHALL BE MAINTAINED AT SETPOINT OF 35% RH (ADJ) VIA DIRECT DIGITAL CONTROL PANEL BY MODULATING CONTROL VALVE V-5 TO MAINTAIN THE DESIRED HUMIDITY. DCP SHALL CLOSE VALVE V-4 WHENEVER THE OUTSIDE AIR TEMPERATURE TT-1 IS ABOVE 55°F OR THE SUPPLY FAN IS OFF.

4.3 IF MAKE-UP AIR HUMIDITY RISES ABOVE 65% AS SENSED BY THE HUMIDITY HIGH LIMIT HHL, THE HUMIDIFIER SHALL BE SHUT OFF AND AN ALARM SHALL BE SENT TO THE DIRECT DIGITAL CONTROL PANEL AND ECC. HHL SHALL BE HARDWIRED TO THE HUMIDIFIER. HHL WILL REQUIRE MANUAL RESET AT THE DEVICE.

4.4 PROVIDE ANALOG FEEDBACK SIGNAL TO MONITOR VALVE V-5 POSITION.

5. FREEZE PROTECTION

_5.1 IF THE AIR TEMPERATURE AS SENSED BY TT-2 FALLS BELOW 45°F [7°C], AN ALARM SIGNAL SHALL INDICATE AT THE DDC PANEL AND ECC. IF THIS TEMPERATURE FALLS BELOW 40°F [4.4°C], AS SENSED BY THE TSL, THE SUPPLY FAN SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIRECT DIGITAL CONTROL PANEL AND ECC. TSL SHALL BE HARDWIRED TO THE SUPPLY FAN VFD AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO, OR BYPASS MODE. TSL WILL REQUIRE MANUAL RESET AT THE DEVICE.

6. EMERGENCY CONSTANT SPEED OPERATION

_6.1 UPON FAILURE OF THE VFD, THE SUPPLY FAN SHALL BE STARTED/STOPPED MANUALLY AT THE DIRECT DIGITAL CONTROL PANEL OR THE ECC THROUGH THE BY-PASS STARTER. FAN SHALL THEN BE OPERATED AT CONSTANT SPEED.

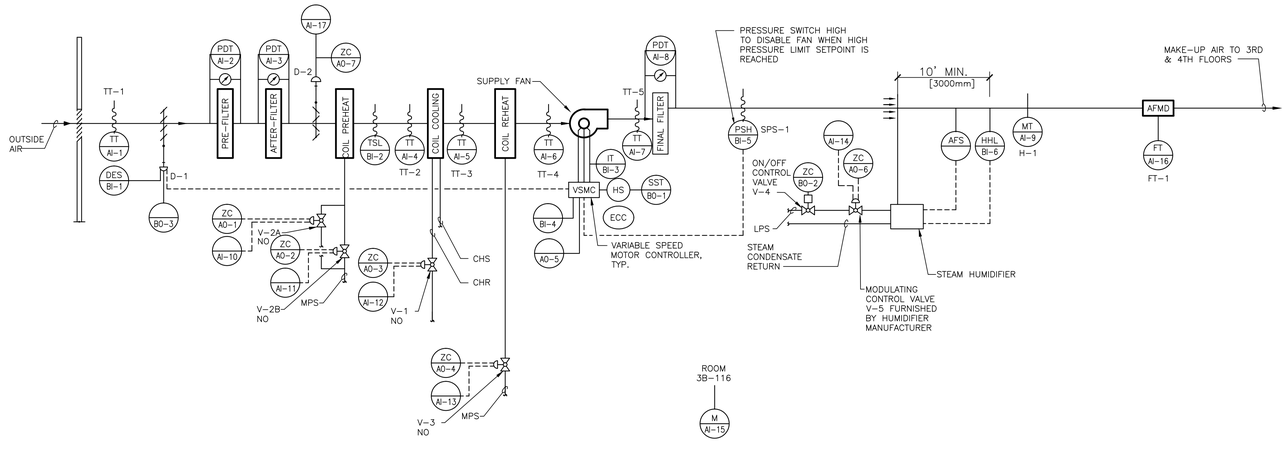
JOB: 517-11-105
BUILDING: #1 - HVAC NEGATIVE AIR CORRECTIONS

POINT LEGEND | SYSTEM OUTPUTS: BINARY, ANA-LOG | SYSTEM INPUTS: BINARY, ANALOG | SYSTEM SOFTWARE/CONTROL: ALARM PROCESSING, APPLICATION/FUNCTION | PAGE:

SYSTEM: MAKE-UP AIR UNIT 1-MAU-14

| SYSTEM COMPONENT: | POINT ID | ABBREVIATION | REMARKS |
|---|---|---|---|
| OUTSIDE AIR TEMPERATURE | AI-1 | OAT | |
| PRE-FILTER DIFF. PRESSURE | AI-2 | PF-DP | +DWYER MANOMETER |
| AFTER-FILTER DIFF. PRESSURE | AI-3 | AF-DP | +DWYER MANOMETER |
| PRE-HEAT TEMPERATURE | AI-4 | PHT | |
| COOLING COIL TEMPERATURE | AI-5 | CCT | |
| RE-HEAT TEMPERATURE | AI-6 | RHT | |
| DISCHARGE AIR TEMPERATURE | AI-7 | DAT | |
| FINAL-FILTER DIFF. PRESSURE | AI-8 | FF-DP | +DWYER MANOMETER |
| MAKE-UP AIR HUMIDITY | AI-9 | MAH | |
| VALVE V-2A FEEDBACK | AI-10 | PHTV2A-STS | |
| VALVE V-2B FEEDBACK | AI-11 | PHTV2B-STS | |
| VALVE V-1 FEEDBACK | AI-12 | CLGV1-STS | |
| VALVE V-3 FEEDBACK | AI-13 | RHTV3-STS | |
| VALVE V-5 FEEDBACK | AI-14 | HUMV5-STS | |
| ROOM 3B-116 HUMIDITY | AI-15 | 3B116H | |
| MAKE-UP AIR FLOW (CFM) | AI-16 | MAF | |
| DAMPER D-2 FEEDBACK | AI-17 | FBD2-STS | |
| OUTSIDE AIR DAMPER STATUS | BI-1 | OAD-STS | |
| PREHEAT AIR LOW LIMIT | BI-2 | TSL | |
| SUPPLY FAN STATUS | BI-3 | SF-STS | |
| SUPPLY FAN VSMC ALARM | BI-4 | SF-ALA | |
| STATIC PRESSURE HIGH LIMIT | BI-5 | SPS | |
| HUMIDITY HIGH LIMIT | BI-6 | HHL | |
| PRE-HEAT VALVE V-2A | AO-1 | PHT-V2A | |
| PRE-HEAT VALVE V-2B | AO-2 | PHT-V2B | |
| COOLING VALVE V-1 | AO-3 | CLG-V1 | |
| RE-HEAT VALVE V-3 | AO-4 | RHT-V3 | |
| SUPPLY FAN VSMC | AO-5 | SF-SPD | |
| STEAM HUMIDIFIER VALVE V-5 | AO-6 | HUM-V5 | |
| FACE AND BYPASS DAMPER | AO-7 | FBD | |
| SUPPLY FAN START/STOP | BO-1 | SF-SST | |
| STEAM ISOLATION VALVE V-4 | BO-2 | HUM-ISO-V4 | |
| OUT. AIR DAMP. OPEN/CLOSE | BO-3 | OAD | |

1 POINTS LIST FOR MAKE-UP AIR UNIT (1-MAU-14) AND HUMIDIFIER
NTS




2 CONSTANT VOLUME MAKE-UP AIR UNIT AND HUMIDIFIER CONTROL DIAGRAM (1-MAU-14)
NTS

## CONTROLS SYMBOLS

| | |
|---|---|
| T | ROOM THERMOSTAT/TRANSMITTER - WALL MOUNT |
| M | ROOM HUMIDISTAT (MOISTURE)/TRANSMITTER - WALL MOUNT |
| TT | TEMPERATURE TRANSMITTER |
| TT | TEMPERATURE TRANSMITTER, AVERAGING ELEMENT |
| MT | HUMIDITY (MOISTURE) TRANSMITTER |
| PT | PRESSURE TRANSMITTER |
| SPS | STATIC PRESSURE SENSOR |
| FT | FLOW TRANSMITTER |
| IT | CURRENT TRANSMITTER |
| CT | CONDUCTIVITY TRANSMITTER |
| SD | SMOKE DETECTOR |
| PDT | PRESSURE DIFFERENTIAL TRANSMITTER |
| PDS | PRESSURE DIFFERENTIAL SWITCH |
| HS | HAND SWITCH (HAND-OFF-AUTO SWITCH) |
| ZC | VALVE OR DAMPER POSITION CONTROLLER |
| KR | LOCAL RECORDING TIME CLOCK (RUNTIME) |
| TSL | TEMPERATURE SWITCH, LOW (FREEZESTAT) |
| HHL | HUMIDITY HIGH LIMIT |
| LC | LEVEL CONTROLLER |
| LT | LEVEL TRANSMITTER |
| PSH | PRESSURE SWITCH HIGH |
| PSL | PRESSURE SWITCH LOW |
| EPT | ELECTRONIC TO PNEUMATIC TRANSDUCER |
| AT $CO_2$ | CARBON DIOXIDE TRANSMITTER |
| AT CO | CARBON MONOXIDE TRANSMITTER |
| AT OC | OCCUPANCY SENSOR |
| LTCP | LOCAL TEMPERATURE CONTROL PANEL |
| HVAC | HVAC CONTROL PANEL |
| VSMC | VARIABLE SPEED MOTOR CONTROLLER |
| AFMD | AIR FLOW MEASURING DEVICE |
| ECC | INTEGRATE CONTROL POINT ON REMOTE GRAPHICS WORKSTATION AT ENERGY CONTROL CENTER |
| TC | TEMPERATURE CONTROLLER. SEE SEQUENCE OF OPERATION |
| PC | PRESSURE CONTROLLER. SEE SEQUENCE OF OPERATION |
| SC | SPEED CONTROLLER. SEE SEQUENCE OF OPERATION |
| FE | FLOW SENSING ELEMENT |
| AFS | AIR FLOW SWITCH |
| DES | DAMPER END SWITCH |
| SST | START/STOP SIGNAL |
| | TEMPERATURE SENSING ELEMENT FOR TRANSMITTING TEMPERATURE TO EMCS (PROVIDE 12 INCHES [200mm] MINIMUM LENGTH IN DUCT WHEN SPACE PERMITS.) |
| A | SENSOR WITH AVERAGING ELEMENT TO TRANSMIT TEMPERATURE TO EMCS |
| | MOTOR STARTER |
| M | ELECTRIC OPERATED CONTROL DAMPER/OR VALVE |
| | WIRING BY TEMPERATURE CONTROL SUBCONTRACTOR |

Building 1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DRAWING TITLE: MECHANICAL TEMPERATURE CONTROL DETAILS
PROJECT TITLE: HVAC NEGATIVE AIR CORRECTIONS
DATE 07/06/2012 | REV. | SCALE

DRAWING No. MH700
PROJECT No. 517-11-105
DRAWN BY: JPA
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